

# Enzymatic

*The Newsletter of the ASBMB Undergraduate Affiliate Network*

Fall 2014

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**UAN**  
**ASBMB Undergraduate  
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## FROM THE EDITOR

*Welcome to the 2014 Fall issue of Enzymatic.*

The students are back. The faculty is back, although it seems most of us have never left. Saturdays are once again for the football team to storm the field while the band pounds out a rousing rendition of the school song. Everything is right with our tiny little slice of the world. One of the reasons I left an industrial career and came back to an academic setting was the energy and excitement that this time of year brings. For many of us, these are the best of times.

But away from campus, fall is also a time for change. Chlorophyll has completed its summer job and left us with the beautiful colors that we all marvel at year after year. For me personally, fall is a time to prepare for what's next.

And there we have the theme of this issue of *Enzymatic*: preparing for a future that is certain to come, but yet has an uncertainty to it. Senior, and even Junior, students recognize that their time as an undergraduate student is drawing to a close. They know that they are graduating, but may not know what their next step might hold. Now some students see their path carved in stone and won't be deflected under any circumstance. They are the lucky ones. Most students I know aren't superhuman, and instead harbor real questions and palpable fear about their future. This issue of *Enzymatic* is all about showering some light on the future and helping students find their way forward.

We lead off with one of the finest feature articles I've read. David Katzmann, Head of the Mayo Graduate School, gives a detailed description of the process that undergraduates, as well as the graduate schools, go through in order to prepare, apply and be accepted into graduate school. This article

isn't just the "how to apply" instructions found on every graduate school's webpage, but a thorough, detailed explanation of how and why each step is important. I feel so strongly about David's article that if I could add any advice to it, that advice would be to print out the article and read it more than once. If you are thinking about grad school, "The Perfect Match" is that important to you.

"The Perfect Match" is just one of the articles that we've put into this issue to help students understand and prepare for the process that is heading their way. Want advice on how to prepare for an MD/Ph.D. program? Got it. Need help organizing a UAN chapter? Covered. Want some help on how to fund an outreach activity? Read on. This issue is packed with great articles and great advice to prepare you for whatever change is coming your way.

**– JIM LAWRENCE, CHIEF EDITOR**

# The Perfect Match

*By David J. Katzmann, PhD, Mayo Graduate School, Graduate Program Director, Biochemistry and Molecular Biology*

Graduate training in biomedical sciences is an exciting time for everyone. Science is moving at a breakneck pace, significant breakthroughs are being made every day, and it's truly a thrill to be part of the discovery process. Yet the amount of new information being generated can be overwhelming, and learning how to utilize new data and discoveries can be daunting. The appropriate training environment can turn this experience from overwhelming to amazing. For this reason, it is critical to choose the best graduate program for you after a thoughtful assessment of each program's strengths and weaknesses.

From the perspective of a graduate program director, I similarly want to find the best applicants that fit with the attributes of our training program. The application process is designed to both help you understand the graduate program and to help the graduate program understand you. But how do we try to make this match? There are three general components to the application process: your selection of where to apply, the application itself, and the interview.

As a pre-doctoral student pondering these options, it is normal to feel anxious or confused about what lies ahead in your future. However, it is important to remember that the people reviewing your application will also be anxious about getting the best applicants into their programs. If you keep your feet on the ground and your eyes wide open as you navigate the process of identifying the best training destinations, the right outcome will be virtually guaranteed.



## Where to apply: Do your homework

So, you have made the decision to go to graduate school. We will start with the assumption that you are a good student with an aptitude for performing research and all you need is the right environment to blossom and make fabulous contributions to science and society. How do you find the right training environment?

This is a decision that will help shape the trajectory of your career, so you want to get it right. The first step is to decide which programs you should apply to. Some institutions have brand name recognition that may resonate with you for a variety of reasons. However, even the best program in the country is only a good fit for you if it matches your scientific interests. You need to investigate the program before you can make this assessment. Some of the issues to consider: What is the general environment of the institution (e.g. college environment, research institute, medical center, or combinations thereof) and how does this align with your long-term goals? What is the nature of the program (e.g. department-centric, cross-discipline/umbrella recruitment, or a mixture) and how does this fit with your certainty of the research area you have chosen to pursue? How large

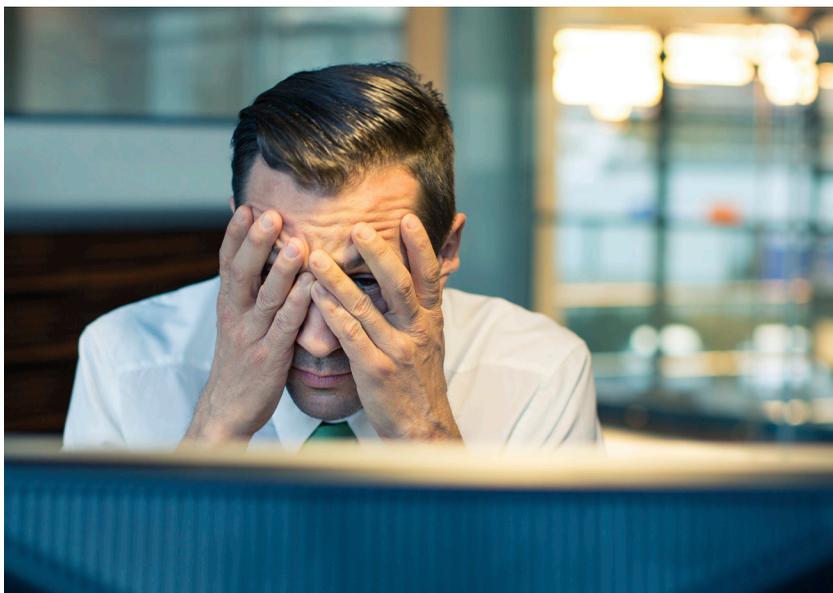
is the graduate program in terms of class size and access to faculty? How are student training costs covered (e.g. general stipends, training grants, opportunities for teaching assistant or research assistant positions)?

Most programs will not constrain students to a specific lab, so it is essential to understand how many investigators are doing the sort of research that you find interesting. Who are they? Are you inspired by their publications? Where have their trainees gone after leaving the lab? It is critical that you select an environment that will foster your intellectual curiosity. You need to be certain that there are a number of individuals who could serve as your mentor and as part of your mentorship team. The ideal scenario would be a significant number of productive, impactful labs doing work that you find stimulating and meshes well with your interests and goals. This is critical for a variety of reasons: faculty members may move or retire, labs may be full to capacity, personalities may clash, or the focus of a lab may change radically in short order.

All of these factors highlight the perils of selecting a training destination based on work of one investigator alone. Good training environments will have numerous people doing great science, but you have to know what they are doing in order to understand whether it is interesting to you. This means you need to do some homework – investigate the research at an institution before you invest the time in your applications.

## The Application: Be True to You

You have distinguished yourself as someone who has a passion and aptitude for research through your



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*“Don’t shy away from describing failures in your personal statement - highlight how you reacted and how these challenges made you better and more motivated to succeed.”*

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experiences and coursework. The application is designed to portray this information to the admissions committee through your academic record, your personal statements, and your letters of recommendation. Your grades and GRE scores are used as a general assessment of your intellectual horsepower and your academic diligence. However, these numbers represent only a part of the picture of you as a potential graduate student. The admissions committee is trying to understand you as a person, your motivation for pursuing graduate studies, your aptitude for research, how you will respond to the challenges you will face in graduate school, and how well you align with the particular graduate program and research interests. In most ways, these criteria are best addressed through your personal statement and are complimented by the letters of recommendation. The admissions

committee wants to understand what initially drew you to science and the particular field of study you have chosen to pursue. We especially want to understand your research experiences. Research is hard. Successful researchers have found strategies to deal with what sometimes feels like a barrage of negative results and failures. There is no shame in falling down, so long as you get back up, learn from what happened, and continue the endeavor.

The only real way to appreciate this aspect of research is to experience it. Hence, it is essential to spend significant time performing research prior to the decision of joining a graduate program. Perform hypothesis-driven research in a self-directed manner, get out of your comfort zone, and generate novel information. The more time that an applicant has spent in a lab, the more likely they have experienced the challenges of doing cutting edge science. Don't shy away from describ-

ing failures in your personal statement - highlight how you reacted and how these challenges made you better and more motivated to succeed.

The admissions committee cares less about the number of techniques you have learned and more about the scientific process you have undertaken. Focus on why the scientific question was important, how you chose to investigate the problem, and what you learned about the topic (and yourself) through this experience. This reveals that you understand the relevant motivations at play – most of what we do is driven by an interesting biological question and there are typically multiple ways to address that question. The motivation should come from curiosity about why the process happens. Your ability to choose a technique to address an interesting question will be learned during graduate school training, but curiosity cannot be taught. It is critical that you convey your motivations in your personal statement.

The third key thing to convey in your personal statement is your research interest for the future. The admissions committee is trying to identify individuals that align with their program and research interests. Your homework exploring different graduate programs will enable you to understand the situation and represent your interests appropriately.

How can this information help your odds of winning over a reviewer? Imagine that you are a reviewer with two applications in front of you. One of them describes the burning desire of the applicant to perform studies that are not well represented at their institution. The other describes how the research of 8 faculty members at the institution sounds amazing and meshes well with their own interests, history, and goals. How would you react? The reviewer will be more inclined to select the individual who took the time to ensure that the program is indeed a good fit for them and can articulate their reasoning.



# Finding the Right Program: Frequently Asked Questions

By *Andrea Anastasio, ASBMB*

*Each year at the ASBMB Annual Meeting, graduate program recruiters meet with students to introduce them to their programs. We interviewed several programs on commonly asked questions about how to find the right program.*

### **Harvard University**

*Michael Lawrence, Senior Administrator for Graduate Programs*

### **What qualifications does your program look for in an ideal candidate?**

The admissions committee looks first and foremost for students who are well-qualified to undertake an independent research project. All aspects of a student's dossier are important components to the entire application. In addition to strong GRE scores and academic background, letters of recommendation from faculty and others with whom the student has worked closely are extremely important.

In terms of coursework, entering students should have a record of introductory courses in chemistry, biology, physics, and mathematics. While the following courses should not be regarded as prerequisites for admission to graduate study, most admitted students have completed these courses as undergraduates: Biology; Biochemistry; Organic Chemistry; Physical Chemistry; Physics; and Mathematics. Competence in elementary programming is also desirable; Laboratory in Biology, Biochemistry, or Instrumental Analysis.

### **What funding is provided for students?**

Graduate Students who are accepted into the MCO PhD Program at

Harvard receive support in the form of full tuition and fees along with a competitive monthly stipend. This is guaranteed as long as the student is making satisfactory progress toward the degree.

### **What research is faculty currently conducting?**

The faculty who are affiliated with the MCO PhD Program conduct research in all areas of modern biology.

### **What do post-graduates go on to do after graduating from this program?**

The Molecules, Cells, and Organisms (MCO) graduate program provides exemplary training to students for a wide array of post-graduate career paths. On average, roughly two thirds of graduates pursue post-doctoral training in the academic realm. The remaining third of graduates follow a wide array of careers outside of academia. These include, but are not limited to: business, consulting, teaching, biotechnology, medicine, writing, law, and scientific policy.

For more information, go to: <http://mco.mcb.harvard.edu/>

### **University of Texas Southwestern**

*Stuart Ravnik, Assistant Professor, Associate Dean*

### **How should I begin my search for the right program for me?**

The internet is a good place to start your search. The top graduate programs are all available online and candidates should look for those professors that are doing research that interests them. You can also read

papers in the research area you are interested and find faculty that are publishing in your area. Rankings are fine, but there is no real difference between the top five and the top twenty-five. Look for programs that have many good options for your research interests, not just one or two.

### **What qualifications does your program look for in an ideal candidate?**

A strong desire and interest in research, research experience that shows the ability to think and do science, with the letters of recommendation to back that up. Having enthusiasm and a mature approach to wanting to learn science is also very important.

### **What funding is provided for students?**

The top programs provide a competitive financial package of a stipend that covers living expenses, coverage for tuition and fees, and some form of health costs to insurance. Nationwide, competitive stipends vary between \$26,000 and \$33,000, depending on school and location. At UT Southwestern, the stipend is \$28,500 per year, all tuition and fees are covered, and all students are provided health insurance.

### **What research is faculty currently conducting?**

Faculty should be currently conducting research, publishing papers, and having current research grants which support the research and the students. The area of research has to be of interest to you and you have to be able to picture yourself doing one or more of the projects in that lab. At UT Southwestern, students can choose from 10 different programs covering

topics from Biochemistry, to Cancer, to Neuroscience.

### **What do post-graduates go on to do after graduating from this program?**

About ninety percent of UT Southwestern graduates go on to do a Post-doc after their PhDs, with most of those headed towards research careers in either academia or industry positions.

### **Virginia Polytechnic Institute**

*Dr. Peter Kennelly, Professor and Head, Department of Biochemistry*

### **How should I begin my search for the right program for me?**

Graduate school is about people, not the name on the diploma. Students should look for schools where they can identify at least three (preferably five) potential mentors: faculty whose research interests them, who oversee an active research program, and who publish regularly.

In the end, you want to go to a program where you can find and be matched with a mentor whom you wish to emulate as a scientist, one whose style matches yours and whose character you respect. Surfing the net is not sufficient to figure out whether a particular program is a good match for you. You need to visit, see the place for yourself, and meet the faculty and students in the program. Remember to ask every prospective mentor: "Where are your former students?" Their answer will reveal much about whether their lab is a good training ground for you. Another good indicator that a program or lab is a match for you are the students. If you "click" with them, you will probably find the place a comfortable and supportive one to work and study in.

### **What qualifications does your program look for in an ideal candidate?**

Research experience and good letters

of recommendation. That is not to say that grades and test scores are not considered, but the first and foremost criterion is a demonstrated enthusiasm for research. No matter how bright someone is, success in graduate study requires motivation, commitment, and aptitude. A good letter of recommendation does not mean that it is filled with superlatives. To be effective, it must be evident that the letter provides a balanced appraisal by someone who knows the applicant well.

### **What funding is provided for students?**

Our department supports Ph.D. students with an annual stipend of approximately \$22,000 per year, which goes relatively far in an area such as ours with a low cost of living. Student tuition is paid by the department. Graduate students receive health benefits as well. Support is guaranteed for a minimum of four years, so long as a student makes significant progress toward their degree. Students TA for two semesters since part of their support comes from revenues generated by undergraduate tuition.

### **What research is faculty currently conducting?**

Here at Virginia Tech (VT), we have a large number of faculty working on understanding and developing strategies for combating a host of infectious diseases that currently plague people across the world. These include malaria, African sleeping sickness, tuberculosis, and Chagas disease. Other faculty in our department are working on the influence of intestinal microflora on health, the role of leptin in body mass regulation, and the protein folding events that occur as part of Alzheimer's disease.

This multifaceted program includes work on the identification of new drug targets, the development of novel drugs, and blocking transmission by insect vectors through genetic

interventions. VT biochemists are investigating the unique metabolic pathways involved in methane production in microorganisms and the signal transduction pathways that help plants resist environmental stresses.

Much of this work is done in collaboration with other departments. Our department is also home to the VT Mass spectrometry incubator, which assists researchers from across the campus in using modern proteomic and metabolomic techniques.

### **What do post-graduates go on to do after graduating from this program?**

There are many potential careers paths for someone who earns a Ph.D. in Biochemistry and Molecular Biology. The ability to think critically and to apply molecular, chemical, structural, and quantitative tools that characterize biochemists has a high degree of transference across the life sciences and well beyond.

My first graduate student pursued a career in industry and eventually started his own company. Another former student became an expert in putting together multi-company teams to engage in drug discovery work and now works for a major consulting firm in Washington D.C. Yet another student elected to obtain postdoctoral training in geology, and now does research in geobiochemistry as a faculty member at Ohio State University. Today, more Biochemists are employed in industry than in academia, and many career opportunities exist "beyond the bench" in finance, genetic counseling, public policy, patent and intellectual property, bioenergy, publishing, etc.

For general information on Virginia Tech's graduate programs, go to <http://www.biochem.vt.edu/>.

## GRADUATE SCHOOL

# MD/PhD & MD Applications: A Process of Perseverance

By Sai Phyo, St. John's University

*This article is targeted at students who want to pursue an MD/PhD degree, or an MD degree.*

Preparing applications for MD/PhD programs not only requires years of preparation – from doing research, to participating in extra-curricular activities, to having good grades – but also requires perseverance during the application process itself. As a fellow MD/PhD applicant, I know firsthand that taking advantage of available resources and staying on top of deadlines can make the process less stressful.

The first step is being sure that you are really passionate about research. If your mind is set on becoming a physician-scientist, start getting as much research experience as possible. You do not necessarily need to be a co-author on a publication, but it will set you apart. Engage in your research project and be able to articulate your role in the project. MD/PhD admission committees are looking for students who are not only successful, but also those who have the potential to succeed.

Second, establish a good academic track record and participate in extra-curricular (clinical and non-clinical) activities. Be aware of the prerequisite classes for medical school. These classes can include one year of chemistry with lab, one year of physics with lab, one year of biology with lab, one year of organic chemistry with lab, one year of humanities, one year of mathematics, and one year of English or English intensive courses. Most medical schools accept AP credits, but some do not. Most medical schools also strongly encourage applicants to take certain biology classes



such as biochemistry and physiology. Be sure to check with each school what their policies are regarding AP credits and pre-requisite classes.

### The Application

The most important step for getting into an MD/PhD or an MD program is the application. The application process includes the Medical School Admission Test (MCAT); letters of evaluation (LOE); The American Medical College Application Service (AMCAS), which is also known as the primary application; school specific supplemental applications, which are also known as the secondary applications; and the interviews.

The primary application is used by all medical schools outside of Texas. Texas medical schools use Texas Medical and Dental Schools Application Service (TMDSAS) instead of AMCAS. However, medical schools such as the University of Texas Southwestern use AMCAS for MD/PhD applicants, but TMDSAS for MD applicants.

Most students decide to apply for medical school by the end of their junior year in college. The application process takes one year, so you will

need to apply by the end of junior year. The best time to take the MCAT is about a semester after you have finished the prerequisites for the MCAT: general chemistry, physics, biology, organic chemistry, psychology, sociology, and biochemistry. The MCAT score is released thirty to thirty-five days after the test date. By taking the MCAT at the end of junior year, students can start the application process knowing where they stand in the applicant pool.

### Letters of Evaluation

Collect LOEs from professors who know you on a personal and an academic level as early as possible. Give them time to reflect on your strengths and write you a great recommendation letter. If you have a pre-medical committee, it is imperative that you utilize the committee letter service instead of sending individual letters. Contact your pre-medical advisory committee early and get information on how to proceed with the committee letter. Almost all medical schools participate in the AMCAS letter service. This means that all LOEs, including the committee letters, are sent to AMCAS before being distrib-

uted to your designated schools.

### Meeting the Deadline

The AMCAS application cycle starts in early May, but you will not be able to submit the application until early June. The deadlines for medical schools vary, but the deadline for the primary application is usually in October. Research the schools you want to apply to and be mindful of the specific deadlines. In addition to the biographical and academic information, there is one personal statement for MD applicants and there is a personal statement, an MD/PhD statement, and a PhD statement for MD/PhD applicants. Once you have sent in the transcript from your school and filled out all required information, you can submit the AMCAS even without sending in your LOE/committee letter. The LOE can be sent later, but medical schools will not review your application until they receive all application materials.

After sending in the AMCAS, it takes about two to four weeks to get it verified and sent to your designated schools. The LOE is verified separately and it can take up to four weeks before it will be sent to your designated schools. If required, the designated schools will invite you to complete the secondary applications and pay an application fee. Policies on sending secondary invites depend on each school. Some schools send out invites to all applicants (e.g. Harvard), but some schools send out invites only to applicants they are interested in (e.g. Vanderbilt). The secondary applications ask for basic information

and most medical schools will have additional essays. The deadlines for secondary applications vary as well. Some have rolling admission while others have deadlines in early October to early January.

After the medical schools receive your MCAT score, LOE, primary application, secondary applications and application fees, they will start reviewing your application. Strong candidates are then invited for an interview.

One tip is to first apply to schools with rolling admission after ranking them based on your preference. This will put you on the top of the list, giving you a higher chance of getting interview invites that are usually emailed starting in early August until the schools have run out of interview spots. After applying to schools with rolling admission, apply to schools with fixed deadlines. The actual interview dates vary, but will be during the fall or spring semesters. Students choose their own interview dates among the available dates depending on their schedules.

Also be sure to utilize your pre-medical advisor. They can offer you insight and can help you with your application essays as well. Get to know them well since they will be the one writing the committee letter.

### Available Resources

There are numerous resources to help you in the application process, including:

- Association of American Medical Colleges (AAMC)
- Student Doctors Network (SDN)

- [www.accepted.com](http://www.accepted.com)
- [www.doctorpremed.com](http://www.doctorpremed.com)

Many schools such as MIT, Harvard, and Johns Hopkins offer great insights regarding application essays on their websites. Finally, an AMCAS fee waiver is available for eligible resident students. More about this can be found out at: [www.aamc.org](http://www.aamc.org).

So to summarize the timeline, aim to take the MCAT by the spring of your junior year, start your AMCAS in May, finalize AMCAS by June or early July, work on your secondary applications from August to December depending on your preference and the schools' admission policies (rolling or non-rolling), go to interviews in Fall and Spring semesters of senior year, get accepted by medical schools during senior year, and matriculate in medical school the semester following graduation.

- For more information on TMDASAS: [www.tmdsas.com](http://www.tmdsas.com)

- For more information on the new 2015 MCAT: [www.aamc.org/students/applying/mcat/mcat2015/](http://www.aamc.org/students/applying/mcat/mcat2015/)

- For more information on AMCAS Letter service check: [www.aamc.org/students/applying/amcas/amcasresources/63226/faq\\_amcasletters.html](http://www.aamc.org/students/applying/amcas/amcasresources/63226/faq_amcasletters.html)

## ORGANIZING A UAN CHAPTER

# What's so Great about the UAN?

*By Bridget Bickers, Sofia Saari, and Ashley Fox, Otterbein University*

What's so great about being a part of the UAN? The best part is that you're able to meet people who love science just as much as you do. The UAN allows you the opportunity to share what you are passionate about with your friends and professors, and the community at large as well. Additionally, becoming a UAN member offers many opportunities that will help you on your way to a career; you are able to do everything from networking with professors to gain research experience, to attending regional and national scientific meetings. Now, you're probably wondering how you can get the most out of your UAN experience; hopefully our story can give you some ideas.

Otterbein University's UAN chapter is not organized in the traditional hierarchical structure that many of our fellow campus organizations use to govern their groups. Instead of having officers with special titles and specific tasks, we have student leaders who emerge from our general membership to assist with activities organized by our faculty advisor, or who organize activities for the group

based off their own interest and initiative. This type of structure allows students to get as much or as little as they want from their affiliation with our UAN chapter, and it gives more students an opportunity to lead and be invested in our chapter than having officers with traditional roles would.

This dispersal of leadership is possible because our chapter members are connected with each other. During the school year, we have the BMB tea hour, a weekly social event where our members can get together and relax and discuss ideas for possible chapter activities. Not only do students attend our weekly BMB teas, but so do the faculty. This gives the student members a chance to speak with their professors in a more relaxed setting, building mentoring relationships as well as giving students the confidence to approach faculty members with ideas for, or ask for assistance with, activities on campus or in the community. Our faculty advisor, Dr. John Tansey, organizes and attends the BMB tea every week; without the supportive environment he helped to create, our chapter most likely wouldn't be as successful as it has been.

In addition to the face-to-face interaction we have with our fellow members each week, our UAN chapter stays connected through a Facebook group. Any and all members are welcome to post to the group's page; this is utilized to share and discuss journal articles and current events, as well as to list ideas and recruit for outreach activities. Students are also more than welcome to post journal articles and other posts in foreign languages. This gives members a broader understanding of the news in science around the world. This forum is another way of building a sense of community among our members, and helps include our compatriots who are unable to attend the weekly social gathering or chapter activities.

The atmosphere of mutual respect and camaraderie we've developed as a chapter allows us to present our ideas for outreach activities to the group and receive honest feedback about who would be interested in participating. This way we can determine if there is genuine interest among members in participating in an activity, instead of having members feel pressured into participating in an officer's pet project. Using this system, we have successfully participated in



fundraisers and community interest fairs. This year we hope to expand our outreach activities to classroom visits. Because all of our chapter members are able to assume leadership roles, we have the ability to organize and attend a greater number of outreach activities than we would if the responsibility to coordinate such activities rested on a single officer.

We receive some assistance from the BMB program to fund our outreach activities, but our student leaders have taken the initiative to search for additional sources of funding. To support our outreach efforts, our chapter applied for a UAN outreach grant, and we are investigating possible resources available to us through the university. These are both ways that other chapters could



possibly fund their budding outreach programs.

Our group's dynamic fosters not only a strong outreach program, but it has allowed us to build several student-led activities for our members. Since many of us will need to take the MCAT or GRE, one of our members created a peer-led study

group to give support to her classmates as they undertook the task of preparing for these tests. We have also had several members band together to form a Women in Science group that is open to all female science majors. We are hoping it can become its own organization this school year.

With the support of our faculty advisor and the contributions of our student members, Otterbein's UAN chapter has had a very successful year. We have developed a community that is more rich and vibrant than is found in many of our fellow campus organizations, and we hope to continue this tradition for many years to come. We sincerely hope that our story can help your chapter grow and succeed in some way this coming school year.

American Society for Biochemistry and Molecular Biology

# UAN

## UNDERGRADUATE AFFILIATE NETWORK

Renewal Deadline: December 5

[www.asbmb.org/uan](http://www.asbmb.org/uan)

MEMBER BENEFITS

- Guaranteed student travel awards to the 2015 ASBMB Annual Meeting in Boston, MA
- Free online subscriptions to:  
*Journal of Biological Chemistry*  
*Molecular and Cellular Proteomics*  
*Journal of Lipid Research*
- Research and outreach funding available to UAN capters only

## NEWS

# Forty-six new Graduates Received Certified Degrees from ASBMB

By *Weiyi Zhao, ASBMB*

It is our pleasure to announce that the following students have successfully passed the 2014 ASBMB certification exam and been awarded an ASBMB certified degree:

#### Texas State University

- Jaime Correa
- Christine Goertz
- Jeffrey Hall
- Alexander Johnson
- Minh Nguyen

#### University of Tampa

- Oscar Vazquez

#### Villanova University

- Michael Abdul-Masih
- Samantha Cambray
- Colin Felter
- Kendall Johnson
- Melissa Morales
- Sarah Mulroy
- Gabrielle Pyronneau
- Sara G. Radecki
- Brendan Shea
- Sarah-Ann Willette
- Rachel Young

#### Virginia Tech

- Whitney H. Beasley
- Sean K. Black
- John Bu
- Amanda E. Cook
- Laura Cramer
- Dustin R. Davis
- James P. Doherty II
- Makaravine Duong
- Eric G. Ferguson
- Jillian Fons
- Taylor M. Galliot
- Cameron Gordon
- Jennifer Ho
- Kathryn Hopkins
- Min Ha Hwang
- Sujung Kang
- Da Sol Kim
- Michael Le
- Michael A. Leonard
- Daeshaun McClintock
- Victoria Morrisette
- Allison Powell
- Recce D. Prussin
- Nicolas Rohr
- Taylor E. Rose
- Don B. Scarboro
- Jacob A. Semones
- Stephanie Seto
- Connor Wander

Of the 193 students who took the exam this year, 154 were from accredited departments/programs. The rest were from schools that volunteered to take the exam as pilots. Sixty-seven out of 193 students passed the exam (34.7%). Of the sixty-seven students who passed, forty-six were from accredited schools and had therefore met the requirements for degree certification.

The ASBMB Accreditation program launched in 2013, and fourteen schools have been accredited. To learn more about ASBMB Accreditation, go to [www.asbmb.org/accreditation](http://www.asbmb.org/accreditation).



# ASBMB Grants Help UAN Chapters do Outreach

*By Geoffrey Hunt, ASBMB*

The American Society for Biochemistry and Molecular Biology Public Outreach Committee has undertaken a number of initiatives to promote and organize science-outreach activities in communities across the country. The most recent venture was a novel partnership with the ASBMB Undergraduate Affiliate Network, a chapter-based consortium of more than 90 institutions. Participation in science outreach is a requirement for UAN chapters, so the partnership was a natural fit. But to spice the pot, the outreach committee worked with the UAN to develop a grant program that would allow chapters to apply for up to \$500 to facilitate student participation in outreach activities.

Ultimately, chapters at seven schools were approved for funding this year. Some are continuing programming that they have been part of previously, while some are starting new programs:

**HENDRIX COLLEGE** will bring student presentations and biology tutoring sessions to underserved students at Wonderview High School in Hattiesville, Ark.

**NORTHEASTERN UNIVERSITY** will work with the Northeastern Program for Teaching by Undergraduates, known as NEPTUN, to organize and teach a series of science-themed classes aimed at local high-school students.

**OTTERBEIN UNIVERSITY** will host a molecular biology-themed exhibit at the annual Westerville (Ohio) Starry Night Family STEAM Festival.

**PURDUE UNIVERSITY** will host molecular biology-themed exhibit booths at Purdue Spring Fest and Celebrate Science Indiana and will make regular visits to local K – 12 science classes.

**THE UNIVERSITY OF TAMPA** will conduct molecular biology experiments alongside students from Tampa (Fla.) Preparatory High School.

**THE UNIVERSITY OF SAN DIEGO** will use amino-acid builder kits to teach fundamental concepts in biochemistry to local middle-school students from underserved communities.

**WISCONSIN LUTHERAN COLLEGE** will support student attendance at its annual Synthetic Biology Summer Camp in Milwaukee.

While this grant program is only one part of a broader effort to involve ASBMB members in science outreach, the dedication and passion of our undergraduate members are encouraging indicators for success. Even better, participation in these activities will instill an interest in outreach that will (hopefully) endure throughout their careers, wherever they end up.

Read more about the undergraduate outreach grant program at <http://bit.ly/Wj5CI5>.

## Upcoming Outreach Opportunities: Getting your UAN chapter involved

### Outreach Grants for UAN Chapters

We are now accepting applications for the ASBMB UAN Student Chapter Outreach Grants! Active UAN chapters are eligible to apply for up to \$500 to support science outreach activities in their local community. Deadline is November 15! For more information, visit [www.asbmb.org/StudentChapterGrant/](http://www.asbmb.org/StudentChapterGrant/)

### UAN Day of Service

Each year, all UAN chapters are encouraged to organize an outreach event around a common theme during February. All participating chapters will be eligible for a prize.

### ASBMB 2015 Annual Meeting: Science Outreach and UAN Activity Poster Session

Submit an abstract to share outreach activities with the science and education community on March 28, 2015. Visit <http://bit.ly/1B7HwNE> to learn more.

# 2015 ASBMB ANNUAL MEETING IN BOSTON, MA

## The Abstract Submission Deadlines are Coming!

By *Andrea Anastasio, ASBMB*

March 2015 may feel like many pages away in your calendar, but it will be here faster than you think. The 2015 ASBMB Annual Meeting will be from March 28-April 1, 2015 in Boston, Massachusetts.

Undergraduate members of ASBMB are encouraged to participate in the ASBMB Annual Meeting. This is an exciting opportunity for them to present their research, network with fellow UAN members, and attend scientific sessions. Don't forget that registration for undergraduates is free!

In order to make sure you don't miss any opportunities at the meeting, the following guidelines outline how to:

1. Submit an abstract to an ASBMB topic category
2. Register for the Undergraduate Poster Competition
3. Apply for UAN Travel Awards
4. Apply for Competitive Travel Awards

### Submitting an Abstract

ASBMB will program volunteered abstracts submitted to over 300 biochemistry and molecular biology topic areas. Authors should first review ASBMB topic categories and select the one most closely related to the submitted research.

- ASBMB topic categories are those with a 2000-series topic number (#2000 – 2390).
- This is a multi-society meeting, so make sure to note the topic number and society to which you submit your abstract.

Only abstracts submitted to an ASBMB topic category by November 6, 2014 will qualify for ASBMB travel awards (including UAN and Competitive travel awards) and the ASBMB Undergraduate Student Research Poster Competition.

For those undergraduates who want to participate in the Undergraduate Student Research Poster Competition, please note that late-breaking abstracts do not qualify for this event.

### Presentation preference

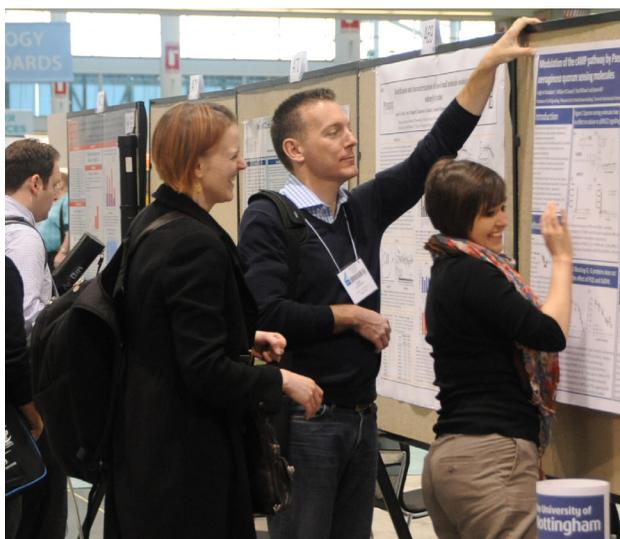
When submitting an abstract to the Experimental Biology meeting, the first author and the presenting author are the same. The presentation preference options are Oral, Indifferent or Poster.

If you wish to have your abstract reviewed and considered for a short, volunteered talk (12 minutes) please mark your abstract with the presentation preference, "Oral."

All authors selected for oral presentation will also be required to present a poster of the same abstract. It is possible the poster presentation may be scheduled on a day other than that of the oral presentation.

Abstracts with an "oral" presentation preference, but not selected for oral programming will be programmed for poster presentation only.

Those abstracts marked with presentation preference, 'indifferent' or 'poster,' may still be considered by the program committee for short talk presentation, based on the quality and scientific relevance. Authors will be contacted to confirm their willing-



ness to present a short talk.

Programming notifications will be sent out in late January from Experimental Biology.

### Registering for the Undergraduate Poster Competition

The registration process for this event is two steps. The first step is submitting an abstract to an ASBMB topic category as the first author. Then all undergraduates who have submitted an abstract by November 6, 2014 will be invited during January 2015 to register for the poster competition.

Remember that all Travel award recipients must participate in the Poster Competition in order to receive their award. If you are a travel award recipient, make sure you are able to take advantage of the award by following all instructions provided for the award.

### Applying for Travel Awards

ASBMB provides several opportunities to help get students to the meeting. All travel awards require abstract submission first. Submit your abstract to an ASBMB topic category (#s 2000-2390) by November 6, 2014.

Application instructions and criteria can be found at [www.asbmb.org/meetings/annualmeeting2015/travelaward/](http://www.asbmb.org/meetings/annualmeeting2015/travelaward/).

The following award applications are due November 11, 2014:

- Undergraduate Student Competitive Travel Award
- Undergraduate Faculty Travel Award (Faculty applicants must be the first author on the abstract associated with the travel award application and unique from any abstract(s) submitted by a student.)

The following award application is due by January 15, 2015:

- Undergraduate Affiliate Network (UAN) Travel Award

The following award application is due by February 20, 2015:

- Undergraduate Affiliate Network (UAN) Outstanding Chapter Award

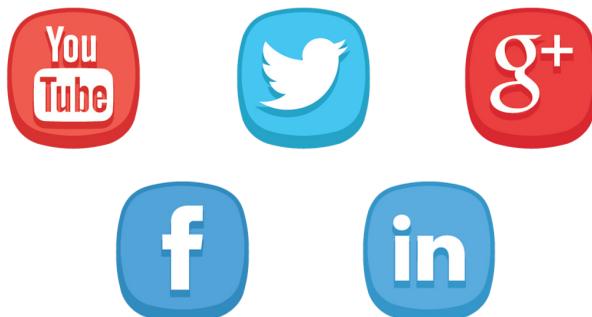
### Contact Information for Questions

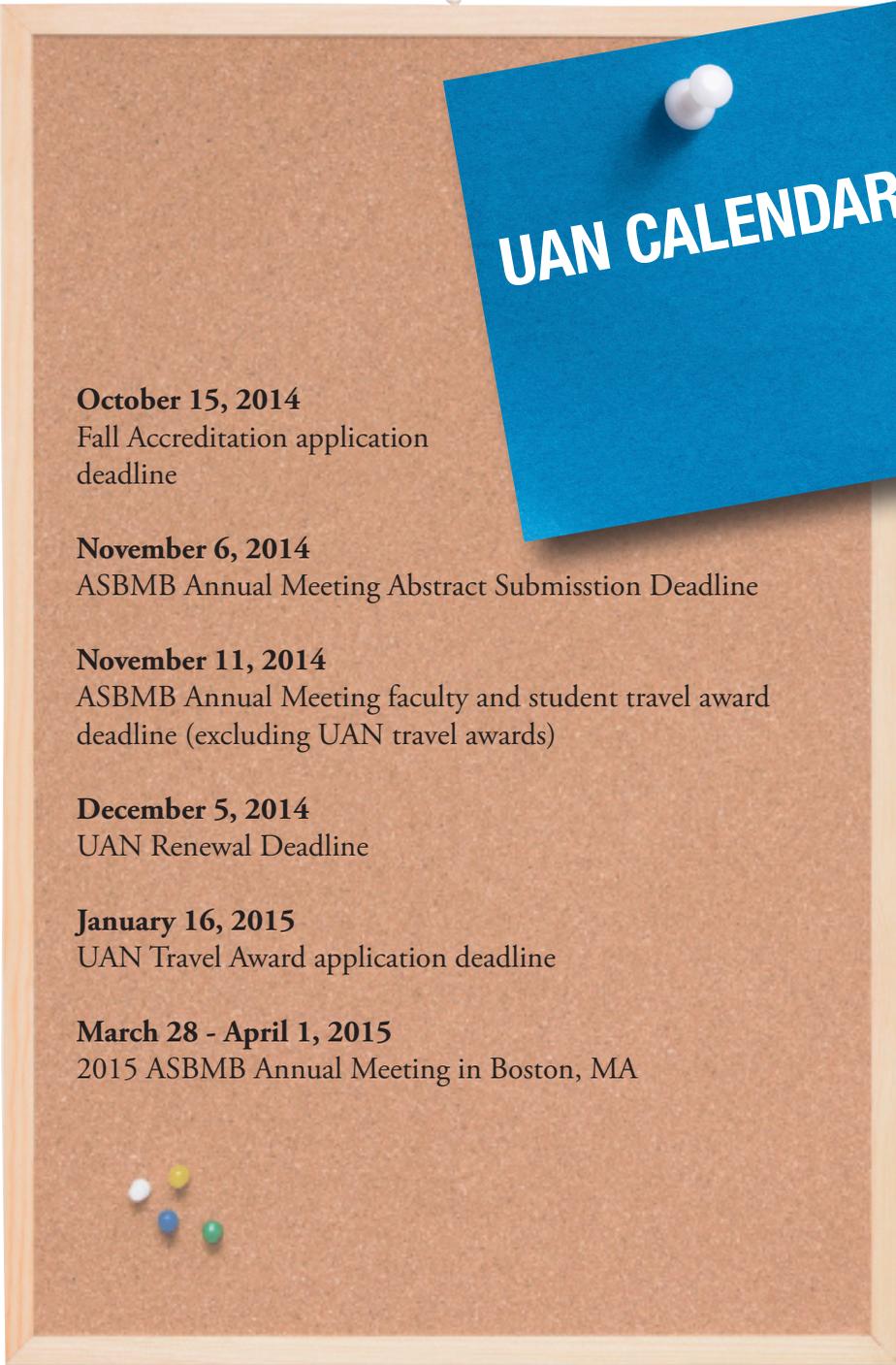
For questions regarding travel awards and UAN awards, please contact Andrea Anastasio, ([aanastasio@asbmb.org](mailto:aanastasio@asbmb.org)), or Weiyi Zhao, ([wzhao@asbmb.org](mailto:wzhao@asbmb.org)).

Any questions regarding the Annual Meeting and poster competition registration can also be sent to [undergradposter@asbmb.org](mailto:undergradposter@asbmb.org).

**Follow UAN and ASBMB to stay up to date with the latest news, research, and opportunities.**

**Questions? Email us at [uan@asbmb.org](mailto:uan@asbmb.org)**





## UAN CALENDAR

**October 15, 2014**

Fall Accreditation application  
deadline

**November 6, 2014**

ASBMB Annual Meeting Abstract Submission Deadline

**November 11, 2014**

ASBMB Annual Meeting faculty and student travel award  
deadline (excluding UAN travel awards)

**December 5, 2014**

UAN Renewal Deadline

**January 16, 2015**

UAN Travel Award application deadline

**March 28 - April 1, 2015**

2015 ASBMB Annual Meeting in Boston, MA

# UAN STUDENT SPOTLIGHT

## For the Love of Science

By Andrea Anastasio, ASBMB

Alice Trye attends Marymount Manhattan College and is involved with the Undergraduate Affiliate Network (UAN) chapter on campus. In 2014, she was inducted into the ASBMB Honors Society.

### How did you first become interested in science?

I first became interested in science in 7th grade when I performed my first frog dissection. It was one of the first times that science became “real.” I thought it was amazing that we could go from talking about all of the structures and then actually see and discover them for ourselves. Ever since then, I have been in love with science.

### What kinds of research are you involved in currently?

I am currently working in the laboratory of Dr. Ann Aguanno. Our lab studies the role of cyclin-dependent kinase 5 (CDK5) in neurodegenerative diseases, specifically Alzheimer’s, and in Type II diabetes. My recent project focuses on the role of CDK5 in insulin exocytosis; we have designed a novel method using immunohistochemistry to assay for insulin secretion using pancreatic tumor cell line, AR42J and chemical inhibition of CDK5. I recently presented my research findings at the 2014 ASBMB Annual Meeting in San Diego, both during the Undergraduate Research Poster Competition and the general poster session.

### Are you planning to attend graduate school after college? If so, in what field?

After college I am hoping to work in a laboratory, likely in the field of cellular and molecular biology or

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*“Getting involved with research transformed me as an undergraduate. It made me think differently, taught me the value of patience, start asking better questions, and how to try even when things do not go right.”*

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cancer biology, in order to put all of my research skills to good use. I think it will also be a great experience to see science in another context and gain more skills. I will use this time to apply and prepare for medical school. My hope is to later conduct research at the graduate level as well. I have learned the importance of research during my college career and hope to incorporate it in my career.



### What are your hobbies or passions outside of science?

Outside of science I enjoy going to the movies, Broadway shows, listening to music, and traveling. I was able to travel to Zimbabwe this past summer where I worked with a non-profit organization called Hoops for

Hope (H4H). H4H uses basketball as a means to build community and teach their “Life Skills” Curriculum to the youth in the underserved and poverty-stricken areas of Zimbabwe. I spent my time teaching basketball and skills such as respect, responsibility, focus, and drug and HIV awareness.

### What are the key experiences and decisions you made that have helped you reach your goals?

Getting involved with research transformed me as an undergraduate. It made me think differently, taught me the value of patience, start asking better questions, and how to try even when things do not go right.

### What is it that keeps you working hard and studying science every day?

Self-motivation and determination keep me going every day. Studying science gets tough, but if you know what your goals are and have confidence in your abilities, you can do anything you imagine.

### What would your dream job be?

My dream job would be as physician working with underserved populations.

## BOOK REVIEW

# John Green's *The Fault in Our Stars*

By Michael Pikaart, Hope College

Why do you love science? What is it about cells, proteins, and DNA and how they work that makes you want to learn about them, study them, maybe even obsess about them a little? There they are, perfect and beautiful...cells that grow into paved monolayers on our culture dishes, or round little colonies on our agar plates; PCR products that make a zillion identical copies of a single molecule; those elegant ribbons and arrows summarizing a protein's structure. The basis of life itself, humming away flawlessly, all the time, whether we know it or not. What an amazing process to get to learn about!

But life, and the molecules that make it go, do not always work perfectly. Sometimes proteins fold the wrong way, and Alzheimer's begins. Sometimes nerve endings don't maintain enough serotonin, and depression results. Sometimes cells divide too much, too fast, and a tumor grows. This, too, is why we learn, because maybe if we learn how those molecules go awry in disease, we can find cures. Maybe your own studies are inspired by a loved one who has suffered disease. Seeing an older person, or a child, whose cells have seemingly turned against her, can inspire thoughts of "let's figure out how to fix this!"

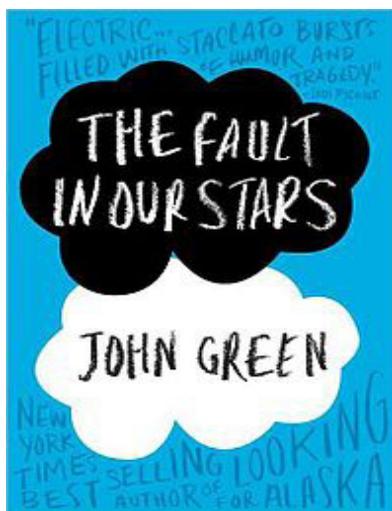
In his novel, *The Fault in Our Stars*, John Green takes the usual boy-meets-girl plot and throws cancer into the mix. Hazel Grace Lancaster is a sixteen year old who lives life in the Republic of Cancervania (as she calls it) since her diagnosis with thyroid cancer at age thirteen. Her disease has metastasized to her lungs, requiring her to use an oxygen tank and leaving her constantly short of breath.

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*"John Green reminds us that, even as we push rocks up mountains, or culture cells, or isolate proteins, it's a lot more fun if we do not do so alone."*

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She is in a precarious remission owing to a (fictional) experimental drug treatment. At her parents' insistence, she attends a cancer support group. There she meets seventeen-year-old Augustus Waters, who has lost a leg to osteosarcoma, but is otherwise in stable health. Although attracted to Augustus, Hazel Grace anticipates the oblivion that will follow her own death and refuses to pursue her affection for Augustus for that reason.



Hazel's disease has prevented her from attending school, so instead she has completed her GED and compulsively re-reads the (also fictional) novel *An Imperial Affliction* by Peter Van Houten, an American living as a reclusive and alcoholic expatriate in Amsterdam. The novel tells the story of Anna, a young girl with leukemia, and ends mid-sentence with Anna's

death. Hazel Grace desperately wants to learn the fate of Anna's survivors – her mother, her friends, even her hamster, Sisyphus. She shares her literary interest with Augustus, who invokes the Wish Genies (analogous to Make-A-Wish in the real world) to arrange travel to Amsterdam and meet Peter Van Houten. The author, however, refuses to offer any comment on the future of any of the characters in *An Imperial Affliction*, instead confirming Hazel's expectation of oblivion and meaninglessness. But while their visit with Van Houten proves disappointing, Augustus and Hazel Grace manage both to fall in love, despite Hazel's determination otherwise, and to have a beautiful time in Amsterdam.

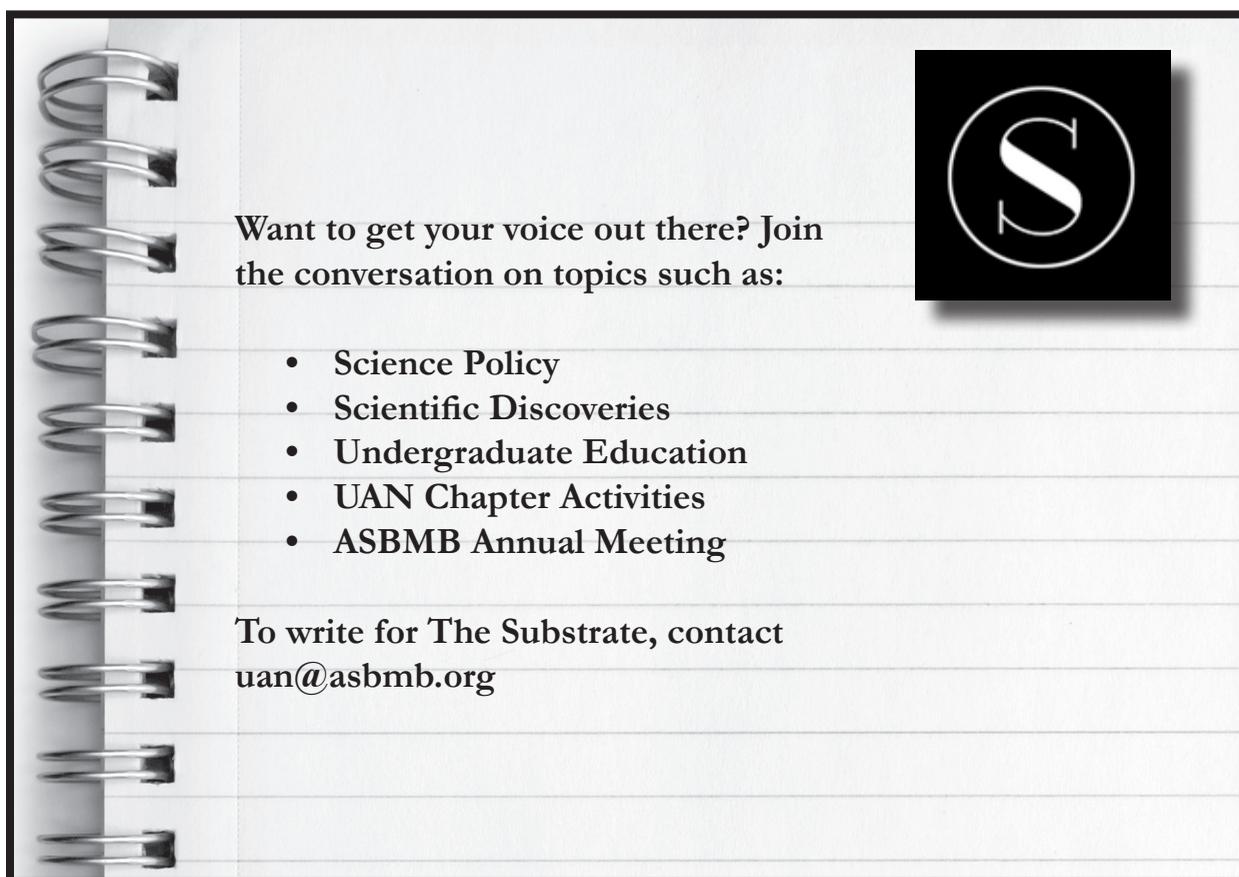
However, it soon becomes obvious that, while Hazel's health is worrisome, Augustus's has taken a turn for the worse as well. Yet the contrast between Van Houten's nihilism and Augustus's ambitious optimism nudges Hazel out of her self-imposed isolation, and she realizes that even those who have loved her most – her parents – will manage to live lives of value even after her own death. Augustus concludes that "you don't get to choose if you get hurt in this world, old man, but you do have some say in who hurts you."

*The Fault in Our Stars* would be a great book to read as a BMB student book club (or go see the film together) and discuss afterwards. Not

everybody will love it. The book can seem to exploit the cancer theme a little brazenly – would a tale of two teenagers falling in love and trying to find meaning in life be any different if they did not happen to be dying of cancer? In real life, children (and adults) with cancer are no more brave, or insightful, or witty or cute, than anybody else. Nowadays it seems our society romanticizes cancer in the same way that tuberculosis was glamorized a century ago, and Green seems to play to that at times. While presenting Hazel's and Augustus's disease in medically realistic terms, *The Fault in Our Stars* comes nowhere

near a realistic portrayal of the pain suffered during cancer. In its defense, though, this isn't meant to be a book about cancer. It's a young adult romance novel, and if it seems a little narcissistic, well, that's what young adults in love are, cancer notwithstanding. Just don't expect the book to deliver you a bracing dose of intellectual motivation as you prepare for your next exam or work through a complicated experiment. Sometimes getting back into the lab and sticking with an apparently failed experiment is going to make you feel like Sisyphus the hamster – running around in its little ball in the name of

the Greek guy condemned to push a rock up a mountain every day, only to have it roll back down. John Green reminds us that, even as we push rocks up mountains, or culture cells, or isolate proteins, it's a lot more fun if we do not do so alone.



**Want to get your voice out there? Join the conversation on topics such as:**

- **Science Policy**
- **Scientific Discoveries**
- **Undergraduate Education**
- **UAN Chapter Activities**
- **ASBMB Annual Meeting**

**To write for The Substrate, contact [uan@asbmb.org](mailto:uan@asbmb.org)**

American Society for Biochemistry and Molecular Biology

# ACCREDITATION & ASSESSMENT

*for* B.S./B.A. PROGRAMS IN

# BIOCHEMISTRY & MOLECULAR BIOLOGY

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The ASBMB has launched a national accreditation program for departments and programs offering baccalaureate degrees in biochemistry, molecular biology and other related degrees. Accredited programs gain access to an independently developed and scored examination for assessing student performance that leads to the conferral of an ASBMB-certified degree.

Programs seeking ASBMB accreditation will be evaluated on criteria such as:

- *Faculty credentials*
- *Support for undergraduate research*
- *Faculty access to professional development programs*
- *Commitment to diversity*
- *Student advising programs*
- *Well-rounded curriculum that includes a robust experiential learning component*



#### ASBMB Accredited Programs:

- |  |   |
|--|---|
| • <i>Goucher College</i>               | • <i>Roanoke College</i>                |
| • <i>Hendrix College</i>               | • <i>Texas State University</i>         |
| • <i>Hope College</i>                  | • <i>University of California Davis</i> |
| • <i>Northeastern University</i>       | • <i>University of Tampa</i>            |
| • <i>Otterbein University</i>          | • <i>Villanova University</i>           |
| • <i>Pennsylvania State University</i> | • <i>Virginia Tech</i>                  |
| • <i>Purdue University</i>             | • <i>Winthrop University</i>            |

**For more information, visit [www.asbmb.org/accreditation](http://www.asbmb.org/accreditation).**

*Application fees are waived for a limited time.*