Application Details

Manage Application: CTL/BP Junior Faculty Teaching Excellence Award - 2018

Award Cycle:	2018
Internal Submission Deadline:	Friday, February 2, 2018

Application Title:	Kwong
Application ID:	002257
Nominator's First Name:	Susan
Nominator's Last Name:	Margulies
Nominator's Title:	Chair
Nominator's Primary Organization:	COE BME
Nominator's Email Address:	susan.margulies@gatech.edu
Nominator's Phone Number:	404 385-5038
Nominee's First Name:	Gabriel
Nominee's Last Name:	Kwong
Nominee's Title:	Assistant Professor
Primary Organization(s):	BME - Biomedical Engineering
Nominee's Email Address:	gkwong@gatech.edu

February 2, 2018

Award Selection Committee
GT Center for the Enhancement of Teaching and Learning

RE: Nomination of Dr. Gabe Kwong for the 2018 Junior Faculty Teaching Excellence Award

Dear Members of the Award Selection Committee:

I am delighted to express my enthusiasm and support of Dr. Gabe Kwong for the CTL/BP Junior Faculty Teaching Excellence Award. Gabe is an Assistant professor in the Coulter Department of Biomedical Engineering. Since his arrival in 2014, he has been establishing a body of excellence in teaching, curriculum development, and research mentorship. Simply put, Gabe is an outstanding example of a junior faculty that is impacting and inspiring our students – I am thrilled to support his nomination.

As you know, there are many ways to gauge an instructors' impact on student learning; if I were to comment on teaching scores alone, Gabe is one of the most effective instructors in our department. In just over three years, Gabe has taught both large (BMED 2210; BMED3310) and small (BMED 1300; BMED 2250) core undergraduate classes in our curriculum. His average teaching score during this period was 4.7/5.0 (range 4.3–5.0), which is remarkable not only because it is above the median for BMED, but also for all of the College of Engineering (4.3 average (range 4.15–4.5); statistics from Fall 2010–Spring 2015).

Despite this, Gabe is not complacent, and continually strives to be better educator and to create new learning opportunities. To deepen student learning and engagement, Gabe has embraced a flip-classroom pedagogy to increase student contact and engagement with course material. He partnered with his colleague in BMED, Dr. Peng Qui, to co-develop the first graduate course in Immunoengineering (BMED 8813), inspiring students to rapid advances in his field of expertise. In fact, his students have openly expressed disappointment that this course is not offered every semester! Moreover, other faculty in the department repeatedly invite Gabe to lecture in one of their classes (Dr. Shuming Nie; BMED 4813) because of positive student reception. This includes video broadcast to off-campus sites including Harvard (Dr. Jagesh Shah; BCMP 312qc).

Gabe is already recognized by the student body as among the most accessible professors on campus. He is invited to and participates in numerous student events – to encourage undergraduate research, to update the local community on cancer research progress, to recruit the next class of STAMP's scholars, to name a few. He has been highlighted multiple times in the Pioneer, our student run newsletter, and enjoys hosting undergrads for dinner through Dinner Jackets or informally at his home. I am particularly struck by Gabe's list of unsolicited emails from former students, which is included in his application packet; they speaks volume to the impact Gabe has on Georgia Tech students, even after they have graduated from the program. Outside of the classroom, Gabe closely mentors the growth and success of his trainees in his research laboratory. His research program is focused at the interface of engineering and immunology where his lab develops biomedical technologies for disease detection and treatment. Gabe has attracted and assembled a full research team that continues to expand every year. His lab now consists of 7 graduate students and postdocs, and 12 undergraduates. Under his mentorship, this group has been honored with prestigious awards including 3 NSF graduate fellowships, 2 T32 Biomaterial Trainee Awards, 1 NSF IGERT Fellowship, 1 Alfred P. Sloan Fellowship, 2 presidential undergraduate research awards (PURA), 2 Petit undergraduate research scholars, and 1 Hertz fellowship semifinalist.

In summary, Gabe is a junior faculty who strives for excellence in education. He is valued by our students for his teaching, a good Georgia Tech citizen, and an attentive research mentor. I hope you share in my excitement and assessment of Gabe – he has my highest recommendation and support.

Sincerely,

Susan S. Margulies, Ph.D.
Georgia Research Alliance Eminent Scholar in Injury Biomechanics
Wallace H. Coulter Chair
Wallace H. Coulter Department of Biomedical Engineering
Georgia Institute of Technology and Emory University

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STATEMENT OF TEACHING PHILOSOPHY

Gabe A. Kwong, Ph.D.
Assistant Professor, Department of Biomedical Engineering

OVERVIEW

> *"Dr. Kwong is one of the best professors I've encountered at this college. He made the course come alive." – Anonymous BMED 2210 student (Fall 2015)*

As an educator, I consider the opportunity to directly shape the development of student engineers to be a humbling privilege and one of the most rewarding aspects of academia. Although the time we spend with students is nominally measured in semesters, I am certain that a successful teacher has a lasting impact that reaches far beyond the classroom and far beyond the content of the course. Ultimately, I believe teaching is about inspiring students to think in a new way – a scholarly independence that allows them to "connect the dots" in rapidly changing fields and to solve problems that no one has yet solved. Since arriving in 2014, I have taught three core undergraduate classes in BMED. These include BMED 2210 *Conservation Principles in Biomedical Engineering* – considered the "gateway" course in our curriculum that exposes students to engineering fundamentals, and BMED 3310 *Biotransport*, which is considered the most technically challenging class for undergraduates in our major because of the breadth and depth of the material. At the graduate level, I developed a new course, along with my colleague Dr. Peng Qiu (BMED), on the emerging field of Immunoengineering. Reflecting on these courses and what I have learned from teaching my students, I can sum up my approach in three words: *clarity, accessibility, and connectivity*. I would like to take the remaining sections to illustrate how I think about these elements in relation to excellence in education.

I. CLARITY

> *"Everything Dr. Kwong explains, he explains exceptionally well." – Anonymous BMED 2210 student (Fall 2016)*

As an alumni of Caltech, I take deep inspiration from Richard Feynman and his larger than life legacy in physics and education. He was known not just as the leading theoretical physicist of his time and winner of the 1965 Nobel Prize, but also as a great educator who could not only breakdown the most challenging concepts in science into easily understood terms, but also find teaching moments in day-to-day curiosities such as *how do trains stay on the track when turning?*[1] His immortalized freshman lectures on physics – the so called Feynman Lectures are well known and illustrate his ability to make physics understandable and approachable to college freshman (and layman alike). I take deep inspiration from his philosophy that *if you can't communicate something in simple terms, you do not understand it*. This insight is strikingly inward facing; an effective educator needs to teach in simple terms not because students need to be taught that way, but as evidence that the educator understands the material completely.

How does this play out in the classroom? I have learned to teach by constantly engaging my students through query. This includes responding to questions my students raise with my own questions that probe the level to which I have effectively communicated a concept. I use this approach to hone in on areas where the material has not been presented in easily understood terms, and then respond with a better explanation. Interestingly, I find this approach increases class engagement by making students comfortable asking questions, and also improves retention

[1] https://www.youtube.com/watch?v=WAwDvbIfkos

of material when students arrive at the answer themselves – which creates a sense of ownership – without being explicitly told the answer. In addition, I constantly look for "hooks" to communicate core concepts, including the use of historical vignettes during class such as *Pascal's barrel* to teach hydrostatic force, or Enrico Fermi's calculation of the strength of the atomic bomb to teach the power of dimensional analysis. One approach that was particularly well received by my students was the use of a floating water faucet, a famous optical illusion, to illustrate conservation of mass. These are a few examples of approaches I take to communicate engineering principles in easily understood terms and with clarity to my students.

II. ACCESSIBILITY

> *"[Dr. Kwong] was approachable, and was always willing to provide further help and a better look into a problem than any of us would expect." – Anonymous BMED 2210 student (Fall 2016)*

The first time I taught BMED 2210 *Conservation Principles in Biomedical Engineering* – the core introductory course in our curriculum that exposes students to engineering fundamentals – it was in a traditional lecture-style format. Although my CIOS evaluations were high (BMED 2210 Fall 2015; Appendix I), I was open to new ways of engagement with my students as I was not satisfied with how my students were performing on their midterm and final exams, especially on material that I thought they should have mastered. I realized that simply providing clear information was not enough to promote student engagement with course content in ways that promote deep learning and a lasting memory. Encouraged by my colleague Dr. Joe Le Doux, the next time I taught the course, I adapted a flipped classroom environment which refocused student learning from lecture to dedicated "problem-solving studios" (PSS) to significantly increase student accessibility and one-on-one instruction. This open and interactive environment allowed me to engage with my students in real time as they were learning the material, and to tailor individual student's learning to what they were having difficulty with. Student responses to PSS were overwhelmingly positive (BMED 2210 Fall 2016; Appendix II), and I have since adapted this approach to teach BMED 3310 *Biotransport*, which was also well received.

Having direct access to first-in-class educators or renowned researchers was not something I realized was an important aspect of learning until higher education. I was born to a blue-collar family and was educated in public schools; as an undergraduate, I went to a major public university where it was not uncommon to be in a class with over 100 students – my freshman chemistry class was taught in a lecture hall that sat over 500 people! Now that my role has reversed, I pay particular attention to make myself available to my students, especially to those that are not performing well in the class. These include inviting underperforming students to drop by my office to plan a path forward, soliciting feedback from students during the course and adjusting accordingly, or simply changing office hours to accommodate more students. I am particularly proud of a student who was enrolled in BMED 2210 fall 2015 for the second time because she failed to pass the course the first time she tried. After our first meeting, it was clear to me she was motivated, but she had to balance other factors in her life including a demanding work schedule. We agreed that were she to commit to dropping by my office every week, I would commit to mentoring her one-on-one. She did, and she came away with a B in the class! Proud of her accomplishment, she sent me an unsolicited email afterward, which encouragingly read:

> *"Thank you so much for ALL your help!! I absolutely appreciate everything!!!..." – BMED 2210 student (Fall 2015), whom I mentored one-on-one and received a B after not passing class first time she took it.*

III. CONNECTIVITY

> *"… I am one of the Stamps President's Scholars for the 2016 cohort…I would like to thank you for taking the time to come speak to the potential BME majors…and I believe that the panel discussion you led was a motivating factor for me choosing to attend Georgia Tech…" – BMED STAMPS President's Scholar, Class of 2020*

Together with my colleague Dr. Peng Qi (BMED), we developed a new graduate level course on the emerging field of Immunoengineering that was offered for the first time fall 2016. This was exciting for me personally, as it provided the opportunity to connect my research with the classroom – my research program merges engineering methods with discoveries in immunology to advance human health. I had been thinking of new ways to reach out to a larger audience beyond the classroom and my laboratory, and I was inspired by how hooked I was to *MinutePhysics*, an educational YouTube channel that explains physics-related topics in approximately one minute. Although there are numerous educational videos online, to me the qualities that set *MinutePhysics* videos apart are their brevity, simple animation, and provocative subjects (*What happens when an unstoppable force meets an immovable object?*[2]). Therefore, as a part of the final project, I tasked students to create a 2-minute video on an emerging topic in Immunoengineering but designed specifically to be understood by non-experts. The production of the videos, which covered cutting-edge research advances such as engineered T cell therapies for cancer[3], were embraced by students, and resulted in several hundred views collectively by friends and family (within weeks of posting!). I envision that future iterations of the course will refine our story-telling, improve the quality of our videos, and connect a larger audience.

In addition to formally educating students within a class setting, I also see an important role for research educators to engage and connect with a broader audience to share advances in science and engineering. Students in my class see this opportunity as well, and leverage my accessibility with them through class as invitations to a variety of outreach activities. For example through my students, I have been invited to share at diverse venues including *Biomedical Research Opportunities Society* (BROS; outreach program to encourage undergraduate research at Georgia Tech), *American Cancer Society Relay for Life* (to update Relay for Life teams on progress in cancer research), STAMP recruitment (to inspire the best STAMP scholars to choose Georgia Tech), *BME Family Weekend Reception* (to discuss current and future happenings of the BME department to families of students) to name a few. I enjoy outreach through these venues and others, because it keeps me grounded and reminds me of the importance of maintaining relationship with the community.

Lastly, I would be remiss not to mention that I also see teaching as an activity that easily extends from the classroom to the research laboratory. Currently, I mentor 12 undergraduate researchers, and we meet on a biweekly basis, along with their primary graduate mentors, to discuss research progress and direction. I take this opportunity to teach skills they may have encountered in class but did not fully appreciate, such as the importance of designing proper negative controls, statistical analysis of data, or critical analysis of primary literature. I have also written reference documents that I go over with undergrads on a periodic basis such as "how to write a scientific abstract" that my graduate students also find useful for their development as well. With the proper mentorship to direct their strengths and help them overcome challenges, Georgia Tech undergraduates are remarkably talented. My current team includes 2 PURA scholars, 2 Petit Scholars, and 8 co-authors on peer-reviewed manuscripts (including 1 first author publication).

[2] https://www.youtube.com/watch?v=9eKc5kgPVrA
[3] https://www.youtube.com/watch?v=B87Fgdh_Xug

CONCLUDING REMARKS

All of us who are lifelong learners were inspired and encouraged at some point earlier in our lives when we were on our way to becoming independent and critical thinkers. For this reason, it is truly a privilege to have the opportunity as teachers to impact the future of students. By teaching students to think critically and problem solve, we not only teach them skills that will help them in their future profession, but also in all aspects of their lives (Appendix III). With high expectations, I look forward to their many future contributions to society as legacy of engineering excellence at Georgia Tech. This motivates me and is what makes my job as an educator so rewarding.

APPENDIX I: CIOS TEACHING SCORES

Semester	Course Name	Course Number	Class Size	Number of responses	Response Rate	Teaching Effectiveness Score (5.0)
Spr 2015	Problems-Biomedical Engineering	BMED 1300	47	21	45%	**4.9**
Fall 2015	Conservation Principles in BME	BMED 2210C	30	13	43%	**4.7**
Fall 2015	Conservation Principles in BME	BMED 2210D	31	14	45%	**4.6**
Fall 2015	Conservation Principles in BME	BMED 2210E	31	18	58%	**4.5**
Spr 2016	Problems-Biomedical Engineering	BMED2250	14	3	21%	**5**
Fall 2016	Special Topics-Immunoengineering	Cross-listed as BMED 8813; ChBE 8803; Chem 8813; ME8873	10	8	80%	**4.8**
Fall 2016	Conservation Principles in BME	BMED 2210	47	44	94%	**4.7**
Fall 2017	Biotransport	BMED 3310	43	42	98%	**4.3**

APPENDIX II: REPRESENTATIVE ANONYMOUS STUDENT CIOS EVALUATIONS

[BMED 2210E Fall 2015]

"Dr. Kwong was very organized and planned his lectures and the course very well"

"He genuinely cared about the students and their well-being…I think he was a phenomenal professor."

"He conveys the material very well, writes and speaks vary [sic] articulately, and can break hard topics into simple and easy to understand approaches"

"Dr. Kwong was a great professor in all regards. He was a great teacher of the material as well as being very fair and showed genuine concern about his students and how they were doing in the course."

"One of the best professors I have had since I have been at Tech."

[BMED 2210D Fall 2015]

"Dr. Kwong is a fantastic lecturer. He obviously cares about what he's teaching, and he gives very helpful examples and explanations. Also good sense of humor, which is a bonus."

"Our professor consistently made himself available to us, and taught the information in a very straight-forward understandable way during class. Also, he really worked to understand how we as students felt about the material and how fair we felt the class was."

"Extremely enthusiastic, empathetic, understanding, intelligent, and welcoming of questions"

"I enjoyed having Dr. Kwong. He was very organized in his teaching and clearly wanted all of us to do well."

[BMED 2210C Fall 2015]

"Did a great job being enthusiastic while teaching which in turn made me more interested in the material. Also I appreciated the time that was spent going over proofs and the 'why' behind concepts and ideas as opposed to being given a formula and then just using that over and over again"

"…I went through the entire course marveling at what a teacher who cares about the subject and the students opportunity to do well can do. He was effective to the point that I believe all bme faculty should watch him teach."

"Fantastic. Best in the department."

[BMED 2210C Fall 2016]

"He was approachable, and was always willing to provide further help and a better look into a problem than any of us would expect."

“Dr. Kwong was always really good at clearing up concepts and spending the time to sit down and help us when we were confused. Whenever I did a problem with him I learned a lot and was able to remember everything I learned”

“PSS sessions were extremely helpful and I learned a great deal doing problems.”

“I loved the problem solving [studio] and really liked how we were drilled in, with constant practice, the correct methodologies to approach engineering problems.”

“Very personable and willing to help the students with their questions so they would fully understand the concepts”

“Everything Dr. Kwong explains, he explains exceptionally well.”

“Dr. Kwong explained everything in a way that was easy to understand yet also helped build a strong foundation for the later concepts. His lectures helped me the most in the course, and his PSS lectures were amazingly helpful. I would have preferred he just teach lecture in our PSS group as I learned more there than in any of the actual lectures.”

[BMED 8813 Fall 2016]

“There was just so much pure information and it was taught in such a close, intimate environment that made me really want to learn and understand everything”

“Amazing professor, very clear and easy to understand. Even though the subject is still relatively new and a lot of material was kind of difficult to learn, Dr. Kwong did a very good job about putting what we learned into context through current research. I only wish he'd teach a full immunology class now.”

“The presentation of course material is very clear and straightforward.”

[BMED 3310 Fall 2017]

“Dr. Kwong is highly engaged and I felt very comfortable asking him questions. He never just told me the answer and helped facilitate my learning. I felt his teaching style to be very clear and concise.”

“Kwong is a great lecturer, his board notes are excellent. His 1 on 1 help is also top notch. He also clearly knowns his stuff here.”

“Very enthusiastic that helps keeps my attention during lecture”

“Professor Kwong is a fantastic lecturer. It's evident that he fundamentally understands everything he teaches and takes the time to prepare for every lecture. He's very approachable in the problem-solving studio, and he does a great job of guiding students to the right answer when they ask him questions.”

“He always explains things clearly and effectively.”

“Without the flip sessions, I would not have survived in this class. Having a professor and 3 TA's in one class really provides the necessary attention needed for such difficult problems sets.”

APPENDIX III: UNSOLICITED EMAILS FROM FORMER STUDENTS

[Example 1]

"Dr. Kwong,

[Dave] and I wanted to say thank you for such a great semester in 2210! We both really enjoyed the material and your teaching style. It was inspiring to see a professor put so much effort into class, when I'm sure you've got some awesome research that takes up most of your time.

If possible, [Dave] and I would enjoy meeting with you sometime next semester to learn a bit about your career path to date. You've obviously been extremely successful and we'd love to hear some of your insights. Is there a week early in the semester where you would have some time?

Have a great holiday season!

Best"

[Example 2]

"Hi Dr. Kwong,

I realize this is kind of unexpected, but I just wanted to personally thank you for how you contributed to my development and professional career. I recently started co-oping at Abbott in California, and I would like to contribute a lot of me getting the job to you. Your enthusiasm in your teaching helped inspire a passion to learn as much as possible when you taught me in both 2210 and in your [Immunoengineering] class, and the latter also trained me very well in reading and understanding high level scientific papers.

I know I was quiet and reserved most of the time which is something I am still working on but be reassured that I was having a great time and learning a lot from you. I hope you have a great Summer and Fall, and once again, thank you!

Best regards,"

[Example 3]

"Good Evening … Dr. Kwong….:

I would just like to take the time to say thank you all for all of your help this semester. I enjoyed learning the material as it was extremely interesting even though it was very difficult. Learning more biomedical engineering skills in this course was extremely exciting as I can apply it to my future whether it be becoming a biomedical engineer in the industry or a medical doctor. All of your lectures were very helpful, very thorough, entertaining, and interesting. I hope to continue refining the skills that I learned and continue to apply them in my future. I hope that you all have an awesome winter break and that you all have a happy holidays!

Thank you so much,"

[Example 4]

> *“Hi Gabe,*
> *Just wanted to congratulate you on being invited to participate in the 2017 US Frontiers of Engineering symposium! I saw the article in the BME newsletter and just wanted to shoot you a quick email.*
>
> *I'm currently working at Adimab in the Antibody Discovery department and I keep thinking back to your immunology lectures. I'm so grateful to you for giving me some baseline knowledge of immunology and antibodies. Thank you!*
>
> *Best of luck,”*

[Example 5]

> *“Good morning Dr. Kwong!*
>
> *… I am one of the Stamps President's Scholars for the 2016 cohort. First, I would like to thank you for taking the time to come speak to the potential BME majors at the SPS Finalist Weekend last spring. I remember being fascinated by your work, and I believe that the panel discussion you led was a motivating factor for me choosing to attend Georgia Tech…”*

[Example 6]

> *“Good Morning Dr.Kwong*
>
> *…Thank you so much for ALL your help!! I absolutely appreciate everything!!!*
> *Have a great rest of your Holiday break!!”*

Peng Qiu
Associate Professor
Department of Biomedical Engineering
Georgia Institute of Technology
and Emory University
313 Ferst Dr.
Atlanta, GA 30332

Dear CETL Selection Committee,

It is my great pleasure to write this letter of support for Dr. Gabe Kwong's nomination for the CETL/BP Junior Faculty Teaching Excellence Award. Gabe and I have co-developed and co-taught a new BME graduate level course in immunoengineering, and we are currently collaborating on experimental design and computational modeling for proteases detection and deconvolution. Therefore, I have interacted with Gabe both in classrooms and in research discussions, and I think he is an exceptional researcher and educator.

The course Gabe and I co-developed is "BMED8813 Special Topics-Immunoengineering", where the objective is to integrate engineering methods and analyses for quantitative study of the immune system in health and disease applications. The course was offered in Fall 2016. Gabe was in charge of the first half, discussing immunoengineering from biology and technology perspectives. I delivered the second half, focusing on computational analyses. Due to our complementary background and expertise, we both attended all the lectures, so I had the pleasure to observe Gabe in the classroom. Gabe has a very passionate and effective teaching style. He is able to present complex biological processes and experimental techniques in very intuitive ways, while keeping the students engaged. In addition, Gabe often introduces the history of how those discovers were made and how those techniques were developed. This is very helpful for students to learn not only the knowledge but also the logic thinking process. I enjoyed his half of the course very much, and learned a lot from him.

Gabe developed the course final project, which required students to pick topics learned during the course and create 2-minute videos to explain the topics to non-technical audiences. Gabe taught the students how to structure compelling short presentations, the appropriate amount of details to make the topics interesting while accessible to non-experts, and visual techniques to assist the presentations. The videos came out to look great. The students gained a lot from the project, and generated several high-quality videos that can serve as educational materials.

In addition to the course, Gabe and I also have research collaborations. I like his advising style, guiding the students to come up with their own hypotheses, rather than just telling them the answers. Students benefit much more from the research process than the conclusion itself.

Overall, I think Gabe is an exceptional educator and advisor. I strongly support his nomination for the CETL/BP Junior Faculty Teaching Excellence Award.

Sincerely,

Peng Qiu, PhD
Associate Professor
Department of Biomedical Engineering

Dear CETL Selection Committee,

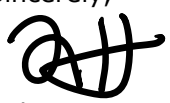
I am writing this letter in enthusiastic support of Dr. Gabe Kwong's nomination for the CTL/BP Junior Faculty Teaching Excellence Award. I am a fourth-year Ph.D student in the School of Chemistry and Biochemistry and I have had the great privilege to interact with Dr. Kwong in a number of academic settings. He has sat on my thesis committee, served as an instructor for the Fall 2016 'Special Topics in Immunoengineering' course (BMED 8813), and will soon be a collaborator. Dr. Kwong has been an incredibly effective communicator and it is clear to me that he has a unique perspective and passion that make him a wonderful teacher and mentor.

I first learned of Dr. Kwong in 2014, as a visiting undergraduate in the lab of my current advisor. I was forwarded an email with the details of Dr. Kwong's seminar as a biomaterials faculty candidate on a multiplex method for measuring enzymatic activity. Unfortunately, I was not able to attend, but I was interested enough to make a note of his name and research. After formally arriving at Georgia Tech as a graduate student that fall, I was reminded to google Dr. Kwong's name and I ended up watching his 'IdeaStream 2014' seminar. I remember being very impressed with the nature of his research and by his ability to communicate complex concepts and ideas. I met with Dr. Kwong shortly afterwards to introduce myself; we spoke briefly about his research and ideas, about my own proposed research and goals, and about the graduate school experience in general. I remember leaving the conversation feeling very excited about graduate school and my decision to attend Georgia Tech. I eventually asked Dr. Kwong to sit on my thesis committee, as the sole out-of-department member. Dr. Kwong was the only member of my thesis committee to take the time to attend an optional presentation on my research and future goals that I gave in my second year. His questions during the seminar and feedback afterwards helped me refine some of my research questions and consider a strategy that neither my advisor nor I had thought of. His engagement with my research during formal and informal meetings has been invaluable. Presently, I am pleased to be involved in a new collaborative effort with Dr. Kwong's graduate students. His guidance and expertise has been, and will be, instrumental in my continued development as a scientist and communicator.

In his BMED 8813 course, Dr. Kwong had the challenge of introducing, to a small group of graduates and undergraduates from diverse backgrounds, the field of immunoengineering and the challenges within. Dr. Kwong very clearly introduced new concepts and ideas in lectures, emphasizing primary literature and the interdisciplinary nature of the field. Dr. Kwong strongly encouraged participation in this class; student questions and comments often turned lectures into discussions and Dr. Kwong into a great facilitator of these discussions. He stressed the importance of combining an engineer's perspectives and methodologies with those of immunologists and other scientists interested in human health. He stressed the connections between broad concepts in immunoengineering and the research carried out in his own lab and in those of his colleagues. The emphasis on research being carried out and recent literature made the class feel like a meeting of a journal club or research group. This was easily one of the most intimate and rewarding classroom settings of my career as a graduate student. I would not hesitate to recommend Dr. Kwong's classes to any person.

My background as an undergraduate was at a small liberal arts college (~ 800 students enrolled), where I cultivated intimate connections with my professors. My conversations and interactions with Dr. Kwong have felt as substantive and special as any I've had in my academic career. Through my interactions with Dr. Kwong and his own graduate students, it is very clear to me that Dr. Kwong has a passion and skill for developing students. I give him my highest recommendation for the CETL teaching award.

Sincerely,



Robert Hincapie
School of Chemistry and Biochemistry | The Finn Research Group
Rhincapie3@gatech.edu

January 22nd, 2018

To the CTL Awards Committee,

I have had the pleasure of receiving instruction from Dr. Kwong in two biomedical engineering courses over the past year and a half, and I feel privileged to be able to recommend him for the 2018 CTL/BP Junior Faculty Teaching Excellence Award. As a senior at Georgia Tech, I have had many professors, but few stand out in my memory like Dr. Kwong does. Dr. Kwong is one those people that you know when you first meet them, that they are incredibly intelligent. That is something you can easily tell because only those who have such mastery over the material that they teach are able to teach some of the hardest content in BME curriculum to a student who has no clue what they are getting into and have them come out with a real understanding of the material.

The two courses I took with Dr. Kwong, Conservation Principles and Biotransport, are considered to be the most difficult in our major. The reputation of these classes was no joke but the clarity of the material the way Dr. Kwong taught it and the time he took to make sure all of his students were really understanding the material, made them more than conquerable. He was also incredibly patient and helpful when dealing with the numerous questions my classmates and I would bombard him with after almost every class. Those extra few minutes he would stay to clarify all of our misunderstandings was one of the reasons I came away with such a good understanding of the material in a class I had no confidence I would do well in.

Another reason I can attribute to that is the problem-solving sessions that we had with Dr. Kwong. It gave us an opportunity to interact more closely while we were in the process of learning and Dr. Kwong really made the PSS worthwhile to attend. He would always take his time at each table, stopping to check to make sure we were on the right path and help us out when we were stuck, but he would never just give us the answers. He would work through the problem alongside us and allowed us to fully understand how to arrive at the solution on our own. He never asked us the easiest questions and a lot of the time we did not know the answers, but he always patiently guided us to until the end. That is what I consider to be a hallmark of the best professors, and that sets an example for students like me, who want to go into academics one day.

But, besides just teaching concepts and solving problems in a way that was understandable and intuitive, one of the best things about Dr. Kwong was how his lectures would demonstrate to us how to apply these engineering concepts in real life, whether it was an example of how you would use it as engineer in the workforce or an example of something you might never really have thought about- my favorite was the concept of similitude and scaling and how that affects those miniature models used in movies and television. He made the material relatable and enjoyable in a way I never expected, and I found myself excelling because of that.

Knowledgeable, understanding, engaging- these are qualities that make Dr. Kwong an excellent choice for the Teaching Excellence Award. I wholeheartedly support his nomination and I hope that the committee recognizes his achievements as well.

Sincerely,

Fatima Z. Islam

Dear committee,

My name is Hassan Fakhoury and I'm a fourth year Biomedical Engineering major. I am writing this letter to express my gratitude for the excellent guidance Dr. Kwong has provided for me, not only as a student in his Biotransport PSS section in the Fall of 2017, but also as an undergraduate researcher in his lab for the past two and a half years.

I first met Dr. Kwong with sweaty palms and an uneasy stomach in his office back in August of 2015. The interview with my future PI came after months of emailing professors to finally get a chance to participate in research that deeply interested me. After a couple of minutes discussing the lab's work, what immediately struck me about Dr. Kwong was his ability to understand my perspective and explain his research in a way that I could understand. To me, however, the ability to explain complex concepts simply does not alone make a teacher remarkable. Instead, it is the degree to which the teacher can share his or her passion with the student. Sprinkled within the conversation were moments of joy and passion that truly amazed me given he had probably explained these research concepts dozens of times to students before me. Not only that, but as a preview of his active teaching style on display during Biotransport, he intermittently asked me questions to direct my thought process. Because of how cheerful his attitude was, Dr. Kwong made me feel more and more at ease as the conversation progressed. I felt that he reveled in the teacher-learner interaction, making it incredibly easy to ask him questions. I left his room feeling elated, refreshed, and most importantly, excited to learn more.

This first meeting with Dr. Kwong left me craving for answers to the challenges of modern medicine and left me with a newfound appreciation for the pursuit of knowledge. It was natural that when I saw his name in Buzzport to register for Biotransport, I clicked the box near his name immediately. At the same time, I was puzzled: the research in our lab does not directly relate to fluid mechanics or mass transfer, so why had Dr. Kwong decided to teach this class? What was his motivation for teaching such an infamous class that did not seem to be associated with our current projects? I got my answer within the first minute of his walking into class.

The reputation of a class like Biotransport scares the Tech BME student. "It's the hardest class in BME," is a phrase I heard often from upperclassmen even when I was a freshman. The syllabus proudly states, "This is a difficult course, possibly the hardest in the undergraduate program at Tech." What I would learn from Dr. Kwong in the first few minutes of class is that it is this reputation (also a reality), this challenge, which precisely motivated him to teach this class. I remember it clearly: "this is difficult material, but this is what motivates me, this is what keeps me going," is what he told all of us before delving into Reynolds Transport Theorem. I'm not quite clear on why he decided to share his motivation with us. Was it to reassure us that even the professor thinks these concepts are difficult, in a way extending a sympathetic hand? Was it to scare us further to motivate us to practice even more problems? Was it to show us the power of grit in the face of challenging material? Whatever the real motivation, Dr. Kwong taught us an important lesson in learning how to learn before he actually began teaching us about conservation principles.

This trend continued throughout the semester, first in PSS Sessions and later as a lecturer to all of the Biotransport sections. Dr. Kwong's number one priority is leaving a group with a stroke of insight and a sigh of relief. One can tell that he finds it unacceptable to leave a table without reassuring himself that the underlying concepts of the problem are fully understood, however long that might take. The same can be said during subgroup meetings in our lab: any concepts related to the research material or research practices in general that are not well understood by the undergraduates offer an opportunity for a teaching point. This makes all of the undergraduates in the room feel included in the research process, in the same way that any group during PSS does not feel lost or left behind. These teaching skills translated well to the lecture setting when Dr. Kwong took over for the second half of the semester. The lectures were extremely well delivered and prepared, and complex equations were reduced and analyzed to ensure full comprehension of the important concepts. His attitude was the same as I saw in my research interview: passionate, exuberant, and eager to teach.

Dr. Kwong's support has allowed me to become the second Petit scholar of the lab, and now the lab was awarded a third scholar for this calendar year. The work during my Petit year has also allowed me to publish co-first author, which demonstrates Dr. Kwong's commitment to undergraduate professional development and success, whether inside the classroom or out. Because of his outstanding qualities as a teacher and mentor, Dr. Kwong will remain a role model to me for years to come, and I'm sure there are many others like me that would say the same. I strongly support Dr. Kwong for this teaching award and could not think of anyone else more deserving of this honor.

Sincerely,

Hassan Fakhoury