

"Stony Brook Chemists: the Blue Sky is Yours"

55th Departmental Convocation
Department of Chemistry,
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Good morning, Chair Wong, esteemed faculty, proud families and friends, and most of all — the graduating class of 2025, congratulations!

I want to take a moment to thank Dr Wong and the whole ensemble of the chemistry department faculty for inviting me to be here today! I feel deeply honored to be standing here with you and share your joy this morning. However, I must confess that I was really nervous when I first received the invitation, as I know how important this moment is for all of you! It was professor Ojima, my PhD advisor, convinced me to come and share the happiness. So my first words to share with you today are, to always keep in touch with your Stony Brook advisors, mentors, and teachers. And be prepared to answer their calls any time. You may be graduating today, but it would be a mistake to think that “wow, I am finally freed”!

Today commences a brand-new chapter of your life, as an individual, and as a professional. Being an elder academic brother who stepped out of this institution a couple years earlier, I can tell you with confidence that there is no need to be nervous or scared. This great department of Stony Brook has got you well prepared for anything you need to face in the future. 30 year ago, when I first join the department, I could not even complete a 30 second introduction of myself. This department trained me, and rebuilt me.

After leaving Stony Brook, I had the opportunity to pursue a postdoctoral fellowship at Sloan Kettering Cancer Center, working with Dr. Sam Danishefsky. A year later I managed to complete the core of a natural product called TMC-95, however, I got stuck and struggled with the final steps of implementing the cis-enamide side-chain to the core. At that time, my wife encouraged me to take a break from the lab. If you know Sam, you have probly heard his famous quote of “vacation is bad for you”, and hardly anyone ever took vacation in his groups. However, I decided to listen to my wife this time. And you know what, after I returned from the break, magically - I can only use this word to describe what happened - the substrate I was trying all conditions and reagents to transform into an enamide, and failed, now just simply upon heating in toluene, nothing else, underwent a new rearrangement reaction, leading to the desired stereospecific synthesis of the cis-enamide! This enabled me to be the first one to finish the total synthesis. The reaction, later called intramolecular proto-desilylation rearrangement, was the star of the Chemical & Engineering News the week it was published. So the reason I am telling you the story, is to let you know that, while persistence is key to your journey, so is the wisdom of those who care for you - your spouse, parents, and other loved ones. In addition, without their love, their support, we would not have been here! Let's give them a loud round of applause! (clap) (thank you).

After the TMC synthesis, I was three months away from joining Merck. Sam handed me another molecule, it was called Guanacastepene A. This is a complicate natural product that requires ~ 40 steps of synthesis and was an interest of many synthetic labs globally. Multiple postdocs in our lab also had been working on it for 3+ years. Knowing this could well be an unended journey, I still decided to take on the challenge. Blessed again by a surprising stereo-selective epoxide opening rearrangement reaction that installed a keto and a hydroxyl group with desired chirality, 35 days later, I shocked the entire lab by announcing that I would have the final compound that night! So the whole group stayed with me, until 2 AM next morning, as I had to spend 2 hours to acquire the proton NMR of the final compound isolated. The

spectrum matched the published one well and I proudly hung the two spectra side by side on Sam's office door and went back home. That was the second first completed total synthesis. It was rare, if any, even in Sam's group. So the second words I would share with you are, as a Stony Brook trained chemist, nothing is impossible for you. So be confident, be brave, and feel free to pursue anything that is in your dream, as you are "capable of doing anything" – these were the words Sam used to introduce me in one of his award presentations highlighting the synthesis.

Three years after joining Merck, I was offered a team including PhD level senior chemists, which was rare, if any, at time at Merck or even cross industry. Thanks to this platform, I was able to deliver a number of compounds to clinical development in the following years. But these were all with small molecules modality, which I was well trained here at Stony Brook. In 2010, Merck acquired a biotech company working on development of glucose responsive insulins. I was tasked to lead the new combined team, which worked on totally new areas and new modalities. Those times were some of the most challenging years for my tenure at Merck. However, they were likely also the most productive and impactful years. Together, the team established for the first time, the end-to-end insulin discovery capability and delivered on multiple insulin/incretin programs to different stages of clinical testing; It also had profound impact on the organization structure as later Merck merged the preclinical development of the biologics and small molecule divisions. Personally, it helped transform myself into a peptide and protein bioconjugation chemist, which greatly benefited what I am doing today. So the 3rd words I would like to share with you are, learning does not end in the classrooms. As you walk out this institution, walk out the door of the chemistry department, the outside sky is blue, and vast. It is filled with opportunities, and challenges. So it is important that you stay curious, never stop learning, and be flexible and adaptive.

Drug discovery, where I've spent most of my career, is a team sport. It involves many disciplines. But chemistry, forms the foundation of the core scientific disciplines. So as a chemist, you are trained as a leader that no other disciplines offer. The emergence of AI, poses a challenge to the old norms. But for all of you as new graduates, this also creates a new opportunity to lead. AI, is the new modern assistance, new tool to empower you. So understand it, embrace it, and become a modern chemist that masters AI, and you will reach the places no one was ever able to get to before. Here, I'd like to share a secret that Professor Ojima may not know even today. I was taking a number of graduate courses at Computer Science Department years ago while working in his lab! I did not foresee the upcoming of the AI era, but I have to admit that my drug discovery career unintendedly benefited tremendously from these computer science courses I took! So be open minded, and pick up something new to learn if you have not already been doing so. Because the future of science — and the future of medicine — won't be built by one discipline alone.

So as you leave this ceremony today, know this: You are Stony Brook Chemists, and you've been given something powerful — an education that challenged you, transformed you, and prepared you to be future leaders. If you keep doing what you have been doing for the last couple years, you will be unstoppable! And if you keep flying, the endless blue sky is yours!

Finally, this place, is where you start to spread your wings; this department, is your home; when you accomplish something, share with us; when you encounter challenges, remember, this faculty and staff, and all alumni, are your family. Do not forget to come back when you can.

With that, Congratulations again, the graduating class of 2025!

And thank you!