Title	I owe what I am today to my respected teacher : Listening to what Associate Professor Kiyotake Suenaga has to say
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I owe what I am today to my respected teacher

Discovering one unknown substance after another from marine cyanobacteria, Dr. Suenaga endeavors to approach and elucidate the usefulness of such substances. He has inherited his preparedness both as a researcher and educator to his respected teacher whom he encountered as a university student. Once a young student lacking an interest in chemistry, why and how did he become bent on the exploration of unknown substances?

How did you spend your childhood?

I was born in Aizu in Fukushima Prefecture and raised in Sendai in Miyagi Prefecture. Since I grew up in a leisurely, stress-free environment, there was nobody who attended a cram school. Also, I was never told by my parents to study hard. So until I graduated from junior high school, I had rarely studied at home.

As a small boy, I thought to myself that I would find employment with the Japan National Railways (now JR) in the future. For me this seemed to be a natural course of life since three generations of my family, from my grandgrandfather to my immediate father, had worked for the National Railways. So I was raised in official National Railways housing. The fact is, my father was one of the first-generation drivers of the Tohoku Shinkansen SuperExpress. When I was an elementary school boy, my father was studying hard to become a Shinkansen driver to prepare for the Tohoku Shinkansen line opening, which I still remember. My own son appears to respect his grandfather much more than his father (myself) because he has no idea about what I'm doing.

What was the impetus for you to make a decision to specialize in chemistry?

I was once reaching for the universe. In fact, my interest had been in physics rather than chemistry until I became a university student. But by the time it was time for me to choose a lab to study in, my interest had shifted to natural products and other complex substances. At Nagoya University in those days, however, studying in the organic chemistry group of the Graduate School of Chemistry required a kind of resolution. It was because there were two professors' labs available – Prof. Ryoji Noyori who was later to win a Nobel Prize, and Prof. Kiyoyuki Yamada, my teacher, both famous for being very strict. I finally decided to join Prof. Yamada's lab.

What was the atmosphere of your lab?

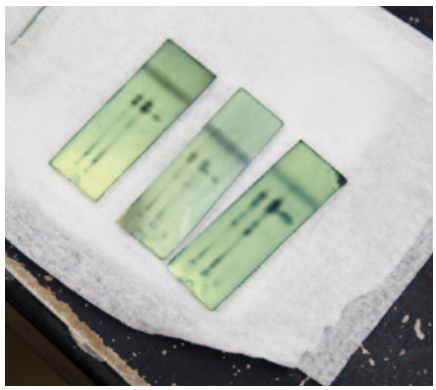
As a newcomer, I had no idea of what the Yamada lab was like, but soon I found that the lab was with great traditions. Dr. Yoshimasa Hirata, the predecessor and teacher of Mr. Yamada, is famous worldwide for his research on tetrodotoxin (globefish poison). Furthermore, Dr. Osamu Shimomura, awarded the 2008 Nobel Prize in Chemistry for his research into green fluorescent protein found in jellyfish, had once studied in Dr. Hirata's lab. By chance, I put myself in an environment that is one of the greatest centers of natural product chemistry.

Even today, I make it a rule to introduce my respected teacher Mr. Yamada's research work "Carcinogenic Substance of Bracken" at the beginning of the "Chemistry of biologically active molecules" class work for juniors of the Department of Chemistry.

What was the first research work in your life like?

My first research theme was chemical synthesis of Aplyronine A. This substance can be obtained from sea hares, a marine organism that looks like a large slug. Aplyronine A is an anticancer substance discovered by the Yamada lab. It interacts with actin, the knowledge of which was quite innovative in those days. I came within an inch of success by the end of the second year of the master's course. But the last reaction would not take place, which put me at the end of my rope after all. Reluctantly, I had to go far back to a substance of the early stage and rebuild the synthesis method. I was like a climber who reached the ninth stage of a mountain but was suddenly pulled back down to the third stage. Even so, I remained steadfast, thinking I should not abandon the project halfway. It was at the end of the first year in the doctor's course that I finally succeeded in the synthesis.

Incidentally, Dr. Hideo Kigoshi (University of Tsukuba), a disciple of Dr. Yamada, has taken over the research into the substance's action mechanism. At a recent academic meeting I had an opportunity to listen to Dr. Kigoshi's lecture that mentioned a new development in the study of the action mechanism.

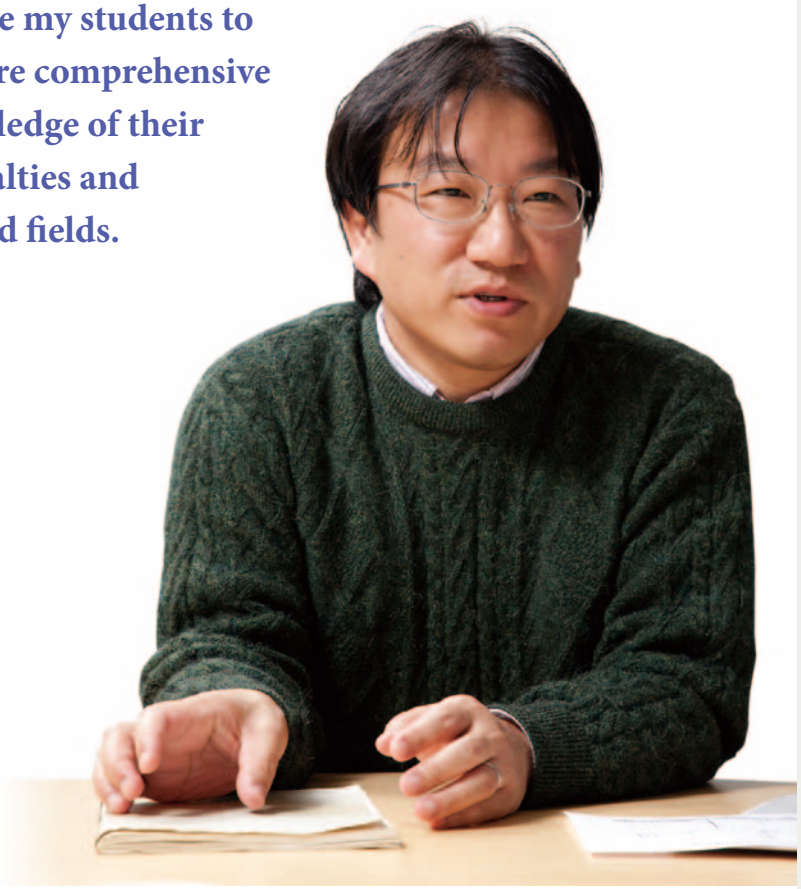


(Left) Marine cyanobacteria are being extracted using an organic solvent. After several days of extraction, the liquid is filtered and enriched inot an extract. / (Right) For research involving chemical synthesis, thin layer chromatography (TLC) is employed to examine the progress of reactions. TLC can also be used as a means for separation.

Kiyotake Suenaga

Dr. Suenaga's specialty is marine natural product chemistry. He is engaged in exploration of biologically active substances. Currently, his focus is on marine cyanobacteria. In 1992, he was enrolled in Nagoya University's Graduate School of Science. In 1995, he left the doctor's course to become a research assistant for the Department of Chemistry, Faculty of Science of the university. In 1997, he acquired a doctor's degree (in science). After serving as a research assistant for Shizuoka Prefectural University (Pharmaceutical Department) then as an assistant professor for the University of Tsukuba (Department of Chemistry), in 2006 he assumed the current position as an associate professor for Department of Chemistry, Keio University Faculty of Science and Technology. Dr. Suenaga was honored with the Inoue Research Award for Young Scientists in 1998 and the Chemical Society of Japan Award for Young Chemists in 2003.

I'd like my students to acquire comprehensive knowledge of their specialties and related fields.



Completion of the Aplyronine A synthesis method urged me to ask Dr. Yamada for permission to isolate it and determine its structure myself. It had been my wish to do the task if I had advanced to the doctor's course. I wanted to find a new substance on my own instead of synthesizing something that has been isolated and structure-determined by someone else. Dr. Yamada told me right away, "Isolate it yourself." I felt that my teacher must have known my wish before I put it into words.

Using an extract equivalent to 250 kilograms of the sea hare, I patiently repeated the isolation process over and over again and finally obtained about 0.5mg of substance called Aurilide.

Your research work seems to require great endurance. What are you doing for diversion?

My hobby is listening to music. Soon after joining the university, I began going to concerts in and around Nagoya. At one time, I went to concerts 50 to 60 times a year. Do you know there are nine professional orchestras in Tokyo? It's an exceptional boon to classical music enthusiasts like me. I'm a subscriber of the Tokyo Symphony Orchestra. Yesterday I went to a concert by the NHK Symphony Orchestra. At some concerts, childcare services are even available, which allows me to place my small sons (aged 6 and 3) under childcare. Sometimes I take my 9-year-old daughter to concerts, but she often sleeps during the performance. I think it's OK because I frequent concerts for my own pleasure (laughter). Anyway, enjoying music is truly refreshing.

I'm also trying to spare as much time as possible for communicating with my children. It's my rule to eat breakfast and dinner with my small ones. Since my home is close to the campus, I go home for dinner and take care of their bathing, then go back to the campus again for work. Being with children is another diversion for me.

What a wonderful papa! How are you dealing with your students?

You may call me a strict teacher. Every week we have one rinko session where lab students take turns reading a textbook written in English, a magazine meeting where students introduce scientific journals they have read, and a study meeting where they learn about instrumental analysis. Of the over ten lab students, five take charge of such meetings every week, meaning that one student will take charge of one meeting every two to three weeks. This is a rather heavy burden on the students as it requires significant amount of preparatory study.

Experiments are one important thing, but there is another more important thing; I would like my students to build up their academic capability by learning broadly. Concerning our specialty, I'd like them to acquire comprehensive knowledge of organic chemistry. Suppose a student who is engaged in isolation and structural determination lacks knowledge of organic synthesis reactions, or a student who is focused on synthesis of a natural product knows nothing about biosynthesis. I don't want my students to be like that.

Looking back at myself, I was thoroughly educated during my student days. In retrospect, many of the tough experiences I had as a student are now proving to be assets for me. A friend of mine who found employment with a private company says the same thing.

◎ Just a word from . . . ◎

● **Student M:** I have an unforgettable memory. Due to our mistake or other reason, we knew that our reservation for rooms at a family-run inn in Tokunoshima Island was not made. In the gathering dusk, I solicited the inn to provide us with two rooms (connected) somehow or other and finally secured the rooms. Even under such circumstances, we energetically gathered cyanobacteria as we normally would. Our teacher's power is always a driving force for us students.

● **Student N:** I joined this lab because it has been my wish to create a variety of substances by using organic chemical reactions. I'm happy and comfortable here because I'm allowed to do almost whatever I want. When I'm in trouble, my teacher thinks together with me and is willing to listen to my proposals.

(Reporter & text writer: Kaoru Watanabe)

For the full text of this interview
http://www.st.keio.ac.jp/kyurizukai