



### Education: Nagoya University Student Association of Medical Research (LOVE LAB)

# Nurturing and Expanding Aspirations to Becoming Physician-scientists



Nagoya University School of Medicine has dedicated a great deal of focus and resources on training and nurturing physician-scientists who will engage in basic medical research and who have research-oriented minds.

"Nagoya University Student Association of Medical Research, otherwise known as "LOVE LAB," was established during the 2011 academic year.

From early in the undergraduate program, students are encouraged and supported to engage in research activities from the entire School of Medicine faculty. Students are given opportunities to network with other universities and receive financial support to go abroad for foreign study or interaction.

We asked the educator responsible for this project to discuss the appeal of LOVE LAB and its future outlook in a roundtable session with participating students.

### The LOVE LAB offers unique support activities to Connect Student Interests with Best-Match Laboratories

#### Provide a brief overview of LOVE LAB and why you decided to participate

**Kuroda:** Nagoya University Student Association of Medical Research (LOVE LAB) is a research support project established in the 2011 academic year to encourage and nurture students who wanted to become researchers or had a strong interest in research. All 3rd-year medical students at the School of Medicine are required to participate in a program called Basic Medical Seminar where they engage in basic research for 6 months at a basic medicine laboratory. This program, now a key feature of Nagoya University's medical school, stimulates student interest in basic medical research and expands opportunities to pursue a research-related career, while LOVE LAB supports all medical student research activities throughout 6 full years of medical school. Opportunities are available for interested students to casually visit various laboratories and learn about their research. Two programs are available to provide various forms of support that allow students to continue at their laboratories even after Basic Medical Seminar is over.

First, in the basic course before students are assigned to a specific laboratory, there are medical science cafe events where students have an opportunity to tour laboratories or hear directly from the researchers themselves about their research. If an undergraduate student wishes to join one of the research laboratories, they are given support for assignment to the laboratory of their choice. In the advanced course, once students are assigned to a specific laboratory, various opportunities are available to join progress reports meetings or Japan-wide joint retreats with other universities.

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Designated Assistant Professor

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#### B MAEDA, Yuki

6th-year medical student at Nagoya University School of Medicine

In the LOVE LAB, conducts research at Pathology and Biological Responses

#### C HASEGAWA, Tomoya

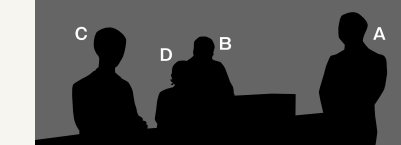
5th-year medical student at Nagoya University School of Medicine

In the LOVE LAB, conducts research at Neurogenetics

#### D OSAKO, Fumika

4th-year medical student at Nagoya University School of Medicine

In the LOVE LAB, conducts research at Functional Anatomy and Neuroscience







**Osako:** I was originally interested in research and chose Nagoya University because it has Basic Medical Seminar where I could experience research from early in my college career. However, once I actually started college, I had no idea what I could study or how to get in touch with the various laboratories. Starting in our freshman year, we toured the actual laboratories thanks to the LOVE LAB laboratory tour. At the medical science cafes, we heard stories from many professors which led to me finding my research theme. In the summer of my freshman year, I received support for laboratory placement, and I've been there ever since.

**Hasegawa:** I'd always wanted to become a physician-scientist so when I was accepted to this university through a recommendation admission program, I started with the basic course which is a prerequisite. During my freshman year, I was assigned to Neurogenetics Laboratory for 2 weeks with LOVE LAB support and have continued there doing research in the advanced course.

**Maeda:** I was also accepted to this university by recommendation and participated in the basic course. However, I felt I needed to bolster my basic knowledge of sciences such as biology before being assigned to a laboratory and I waited until my 3rd year to complete my basic medicine courses before choosing a laboratory. That's why I didn't really start doing research at Pathology and Biological Responses until May of my 3rd year.

**Kuroda:** While all 3 students have utilized the LOVE LAB resources and are assigned to laboratories, the timing and reasoning for their choices are all different. There are various

patterns in how students begin their research and we hope to provide a variety of opportunities so that the students can choose what suits them best. During the freshman year, students rarely know what they want to study and even when they do, they don't quite understand how that might relate to the research being undertaken at the various laboratories. I feel that's where LOVE LAB plays a vital role in understanding these potential issues and helping students avoid mismatches which might actually cause them to lose interest.

*Finding a theme that sparks your interest and dedicating yourself to research from as early as your freshman year*

**What kind of research are you currently involved in?**

**Hasegawa:** In my lab, I study molecular hydrogen. I am currently trying to discover what mechanisms are involved in biological effects of molecular hydrogen, and how they may be useful in treating diseases such as Parkinson's disease and stroke where oxidative stress plays a pathogenic role. This type of ambitious theme is something you can only attempt as an undergraduate, and I've received support to present at academic meetings and retreats. Thanks to these opportunities to present and discuss my research at LOVE LAB, I won first prize for my presentation at Basic Medicine Seminar during my 3rd year.

**Osako:** I belong to Functional Anatomy and Neuroscience laboratory and recently, I've been studying a cell known as peripheral nerve macrophages. They're well-known immune cells that are involved in nerve development. Since they may be associated with demyelinating diseases and inflammatory diseases, I am investigating the developmental stage of nerves.

**Maeda:** My research theme is asbestos-induced carcinogenesis. Asbestos is a well-known cause of malignant mesothelioma, but the carcinogenic mechanism remains unknown. I am focusing on how iron affects mesothelial cells, and specifically how iron may be involved with asbestos-induced carcinogenesis in an attempt to establish a new treatment for malignant mesothelioma.

**Kuroda:** Every year 100 to 110 students enroll in our School of Medicine program and approximately 60 to 70 percent of those students go on to the graduate school program. In other words, the majority of students expect

to engage in research at some point in their future. However, as the students have pointed out, university-level research is extremely advanced. Therefore, students can utilize the LOVE LAB resources to deepen their understanding towards research or identify a research theme for Basic Medical Seminar or receive support to continue research after the seminar is completed or assist in ensuring their research activities go smoothly after starting graduate school.

*Interaction enhances aspirations illuminating new worlds to discover*

**What makes LOVE LAB so special and important?**

**Maeda:** Those who are currently doing research are still a minority among all of the medical school students and they may sometimes feel isolated. LOVE LAB offers joint retreats or progress report meetings with other universities in Japan such as the University of Tokyo, Kyoto University, and Osaka University. By interacting with other universities and other students and hearing their stories, students feel less isolated, that they are not the only medical students doing research and encouraging them to work hard. This is a major advantage of these networking opportunities. Through these interactions among students, an advantage is that you can expand on approaches to research. Progress report meetings provide freshmen with an opportunity to directly experience research firsthand.

**Hasegawa:** Progress Report Meetings are held in small groups and most participants are students so you can feel less intimidated about asking questions freely regardless of content. Not only do you learn about other



areas of research, but you learn to engage in active discussions, and this allows you to hone your basic presentation skills. Since you meet older students who are juggling didactic curriculum with research, you learn how they got through it and this is very useful. And more than anything, LOVE LAB provides



financial support for academic meetings, a huge advantage for an integral part of research activities.

**Maeda:** Absolutely. Last year, Hasegawa and I went to a research meeting at Korea University in South Korea attended by medical students from all over Asia and gave research reports in English. Just the other day, I participated in a symposium at the General Assembly of the Japan Medical Association and was given an opportunity to present as a symposiast although I am still just a medical student. Through LOVE LAB, I have been given huge opportunities beyond anything imaginable and I have been grateful for the chance to learn so much from my experiences.

**Osako:** I can't help feeling motivated after participating in these academic meetings and retreats. They give me an opportunity to acknowledge that "there are so many students engaged in research" and I find myself greatly stimulated by the honest dialog and discussion with students from other grades or schools. The retreats held in our school provide opportunities to discuss a wide range of topics with a drink in hand in a relaxed and free environment.

**Kuroda:** The advantages of LOVE LAB is that like club activities, there are few restrictions and students are free to engage in research that suits their style. You see this type of atmosphere during retreats, too. Of course, it takes a lot of work to bring your research to the point where you can present, but support from LOVE LAB is what gives many students

the chance to try attending and presenting at academic meetings and retreats.

**Hasegawa:** Another advantage is that there are mentors such as Professor Kuroda who act as our go-betweens with various laboratories, facilitating our activities. As a student, it would be very difficult to suddenly visit a professor's laboratory, but educators like Professor Kuroda give us information on various labs and this is extremely helpful.

*To save patients waiting 100 years in the future*

**Tell us your outlook for the future**

**Kuroda:** At the core of our initiative is Basic Medical Seminar that Nagoya University has continued to offer for over 30 years. We gather students seeking to conduct research through admission by recommendation programs and LOVE LAB supports these research activities. Thanks to these initiatives unique to Nagoya University, there has been a definite increase in students who enter our university aspiring to become physician-scientists. We are creating an environment conducive to supporting students who actively seek out research opportunities and hope to take this even further. In the future, we will expand our approach to high school students and believe we need to change the mindset of those laboratories that will be training these students.

**Hasegawa:** In order to increase the number of students who take advantage of the LOVE LAB resources, it is important to ensure that students are informed before admission. I'm also interested in how I personally can continue my research activities in the future. As more undergraduates get involved in research, we, as students, will have to consider how we can continue to pursue research opportunities after graduation. The university and university hospital should also offer ways to support students and graduates by offering programs and suggesting career paths that will allow us to continue doing research while acquiring clinical experience to ultimately become true physician scientist researchers.

**Osako:** I agree. After hearing your opinions, what really stood out for me was that almost all the activities mentioned were approaches by the university. Now it's our turn as students to share our opinions on what we need to continue conducting research. We are the pioneers responsible for changing the status quo where physician-scientists continue to decrease. **Maeda:** Thanks to support from LOVE LAB,



I was able to participate in an academic society conference and receive guidance from our professors to continue research, I believe it is my role to help younger students understand this. I also hope to share how much fun we have with LOVE LAB and appeal the advantages of the encouraging environment provided by Nagoya University to others outside our institution and teach other students that the physician-scientist is a viable career choice. Of course, the physician's job of helping the patient before you is both worthy and a clear path to pursue. However, when it comes to basic research, you have to understand it takes perhaps 50 to 100 years before we get to see research results come to fruition. But licensed physicians also need to engage in scientific research. If doctors comprehend the significance of basic research which provides the foundation of future medical care while they are still in medical school, I am sure more people will pursue careers as physician-scientists.

**Kuroda:** Nagoya University School of Medicine should be engaged in nurturing graduates with a research-oriented mind. Although it is sometimes difficult to envision how basic research is going to help society, it is our current research that will eventually form the foundation for cures that save tens or hundreds of thousands or even millions and billions of people 100 years in the future. LOVE LAB is dedicated to passionately educating medical students on how appealing the career of a physician-scientist can potentially be.

