

UC Irvine Student Receives NWRI Fellowship for Biological Pollutant Research

Winter 2001 -- As an emergency medical soldier for the Korean Armed Forces, 21-year old Joon Ha Kim had the opportunity to both examine and treat infections — and discovered a passion for microorganisms. He was especially interested in how infectious microorganisms, like the influenza virus, moved through the environment and affected human beings. So, once his 27-month military tenure ended, he decided to study Chemical Engineering at Korea University in Seoul, Korea.

Joon was a top-ranked student at Korea University, earning the Outstanding Student Award each year in the Department of Chemical Engineering and a fellowship from the Hankyurae Korean Newspaper. During that time, he taught a science course at the Private Academic Institute in Seoul to prepare high school students for the Korean Scholastic Aptitude Test (SAT). He even published a textbook on how to earn higher SAT scores.

When he graduated with his Bachelor of Science degree in 1998, he immediately pursued a Master's degree in Biochemical Engineering at the University of California, Irvine (UCI). This, he felt, was the natural choice.

First, biochemical engineering — or, the study and science of chemical change resulting from biological action — is a new field within the science and technology arena, and UCI, with a renown biochemical engineering program, is one of the few universities that has a biochemical engineering laboratory.

Secondly, his fascination with pathogens drew him to the field. “Environmental engineering is more closely involved with human health than other engineering fields,” he said. “So I’m happy now.”

Yet, at the same time, he sees it as his responsibility to be a biochemical engineer.

“The chemical engineering field has created a lot of convenient products for sustaining human life but, nowadays, it has also created contamination as a side effect,” he said. Some of these side effects include mutated or toxic microorganisms, which have contributed to water pollution problems. “Basically, as one of the chemical engineers, I felt partially responsible for these problems. I believe that the knowledge of biochemical engineering will help me understand and solve these problems.”

Joon, now 29, recently completed his first year as a doctoral student in the Biochemical Engineering Program at UCI and is currently working on his Ph.D. dissertation. With the help of a \$25,000 NWRI fellowship, he plans to develop and implement monitoring stations along the Santa Ana River in Orange County, California, to measure the movement of biological pollutants (including indicator microorganisms and human pathogens) from various water sources, such as saltwater marsh habitats and urban runoff.

His ultimate goal is to develop a water-quality forecasting model that could be used to predict the downstream levels of biological pollutants from various sources in the lower regions of the Santa Ana River.

Said Joon, “River pollution arising from urban runoff as well as agricultural waste has increased. If we understand the effects of river pollutants (especially, biological pollutants), then we may find ways to increase the quality of river water.”

Joon is no stranger to this type of research. Over the past year, he has contributed significantly to a UCI research project investigating the possible sources of bacteria contamination at Huntington State Beach in California, which resulted in beach closures during the summer of 1999. He also has worked on a similar project regarding the Santa Ana River.

Hard-working, enthusiastic, and dedicated, Joon is an outstanding graduate researcher with an impressive history and more than promising future in the field of biochemical engineering.

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