# Behind the Scenes in Pharmacognosy: Pesticides of Natural Origins

*This year, the* Journal of Natural Products (J. Nat. Prod.) *published "Bioactive Dihydronaphthoquinone Derivatives from* Fusarium solani*," work from the laboratory of ASP member Dr. Fumio Sugawara, Professor in the Department of Applied Biological Science at the Tokyo University of Science, Tokyo, Japan. Dr. Sugawara's work targets the discovery of pesticides from natural products. We are grateful to Dr. Sugawara for sharing his laboratory's project in more detail, including the group's fondness for barbeque. Please read the online article (*J. Nat. Prod., *2014, 77 (9), pp 1992–1996. doi: 10.1021/np500175j).*

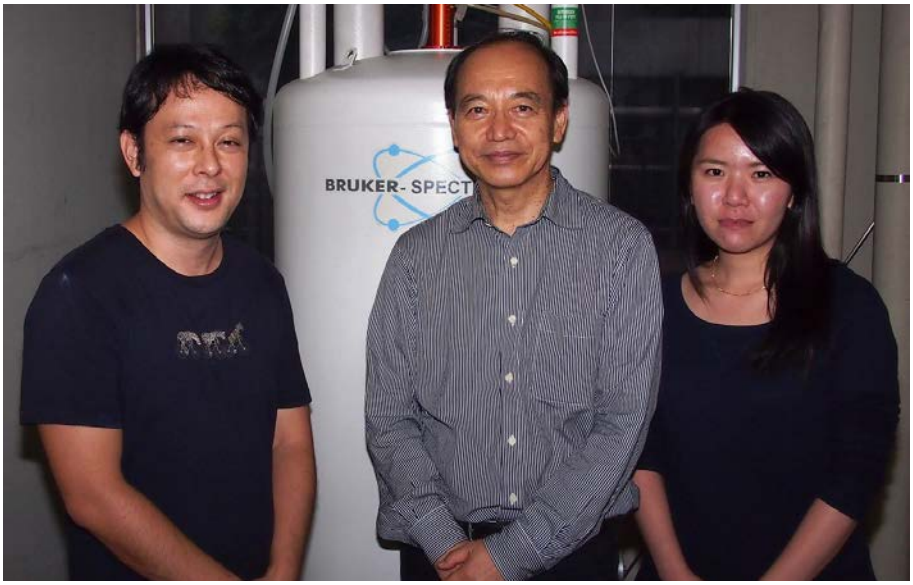
*By Dr. Amy Keller*

**How did you become interested in bioactive fungal compounds?**
My major was pesticide chemistry when I was a graduate student in the mid-1970s. My research goal is to develop "biological pesticides" using fungi and also "natural product pesticides."

**Who in your laboratory carried out the research?**
Assistant Professor Dr. Shinji Kamisuki directs structural determination and organic synthesis, and I direct phage display and protein identification including computer analysis.

**Could you provide a brief explanation of the work and results in your own words?**
In the mid-1990s, most natural products we isolated were "known compounds" as usual. We tried so many laboratory techniques to get "new compounds." The answer was simple. We sterilized tissues of collected organs to "kill common fungi" by 60% alcohol or 5% acetic acid before fungal isolations. As a result, it was possible to obtain a lot of "new compounds." For example, former graduate student Mr. Kenji Takemoto, who joined my laboratory for three years to finish his thesis, isolated 50 compounds including 13 new compounds (25%!) from 14 strains of isolated fungi.

**Please explain to our members the differences in cells used for the cytotoxicity measurements. What do your results tells us about bioactivity of the compounds?**
New dihydronaphthoquinone derivatives, karuquinone A, B, and C, and three known compounds were isolated.



From left to right: Dr. Shinji Kamisuki, Dr. Fumio Sugawara, and Ms. Pei Thing.

Mr. Kenji Takemoto.

These compounds were tested for cytotoxicity against common three human cancer cell lines (HeLa, HuH-7, and HCT116) and a human umbilical vein endothelial cell (HUVEC) line. Karuquinone A exhibited the strongest cytotoxic activity and induces apoptosis in cancer cells through the generation of reactive oxygen species.

**What is a favorite nonscientific activity of your lab?**
We love to barbeque (BBQ), as the university has a nice BBQ facility in a Japanese garden.

**What is your lab's motto or slogan?**
Think!

**What is your greatest extravagance in the lab?**
An antibody to detect natural product binding protein. ■