

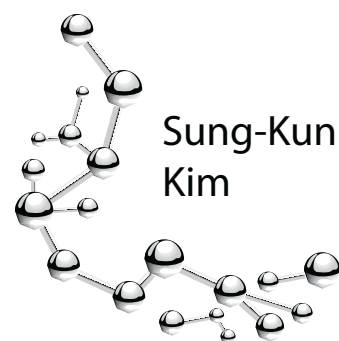


In our lab, we have been working on a couple of projects. Developing novel inhibitors that can help cure patients who are infected by drug-resistant bacteria is one of our projects our team is working on. Particularly, Sara Schlesinger and Sang Gon (Scion) Kim have focused on this project. They have successfully expressed metallo-beta-lactamase and purified the protein, and they have tried to find potential inhibitors of the protein metallo-beta-lactamase. Because the protein is a main cause of drug-resistant bacteria, finding effective inhibitors of the protein will be a solution of drug-resistant bacteria issues. We are very dedicated to this project.

Developing early disease diagnostic system is also a project we are working on. Mieke Lahousse, Sheena Shipley, Taylor Foster, and Scion have been working on these projects. Mieke and Scion worked on finding detecting materials using a novel

combinatorial, high-throughput method, SELEX, against a toxin from anthrax in collaboration with Korean universities – Hanyang and Ewha. Finally, we found materials that can detect the toxin with high binding affinity and high selectivity. We called those as BH-2, and -4, where BH stands for Baylor and Hanyang (only you who are now reading this article know this secret, and of course Baylor's name had to come first). Taylor Foster passed her research proposal for her Ph.D. requirement this July, 2010 with her projects – developing detecting materials against an opportunistic pathogenic Gram negative bacillus, *Enterobacter aerogenes*. Sheena Shipley has also worked on finding detecting materials against *E. coli*, and she plans to graduate with a MS degree this fall.

Mechanism studies on redox proteins are another set of ongoing projects. Jong-Sun (Sun) Lee and Scion have worked on these projects. Sun has successfully cloned a new gene, and purified the protein using *E. coli* expression system. It turned out that a function of the protein is converting a sulfate-attached nucleotide to sulfite in an archaeon, a bacterium that can survive under extreme conditions. This is the first discovery in the sulfate pathway in an archaeon. Scion is a superman in our team. He has worked on almost all of our projects, and he also focused his own



projects such as thioredoxin-like proteins, arsenate reductase, other reductases, and more.

This spring, Sun, Sara, and I went to the ACS National meeting in San Francisco, CA. We visited UC Berkeley and the Golden Gate Bridge, along with presenting our research topics at various ACS sessions. During this summer, I went to Washington D.C. to visit the Department of Defense (DoD) and the National Institute of Health in order to meet with program managers, supported by the Vice Provost Office for Research and our department. I also had a great opportunity to present my research topics to the DoD.

Every year during the summer, we try to interact outside of the lab by going to the movie theater and eating lunches together. Last summer, we watched "Transformers 2" and went to Kitok restaurant and this summer we continued our Kitoks tradition. This year, many people tried to have some Korean food in place of the world famous hamburgers. I will continue to tell our beautiful team story next year!



Top row: Dr. Sang Gon (Scion) Kim, Jong-Sun (Sun) Lee (G), Dr. Sung-Kun Kim, Ethan White (U); Middle row: Mieke Labousse (G), Taylor Foster (G), Connie Tang (U), Sara Schlesinger (G); Front row: Sheena Shipley (G), Kristin Brown (U); G: Graduate student; U: Undergraduate student

Publications

Kim, S.G., Kim, S.T., Wang, Y., Kim, S.K., Lee, C.H., Kim, K.K., Kim, J.K., Lee, S.Y., and Kang, K.Y. (2010/01) Overexpression of rice isoflavone reductase-like (OsIRL) confers tolerance to reactive oxygen species, *Physiologia Plantarum*, 138, 1-9.

Xu, X, Schumann, P., Chung, J.S., Hass, M.A., Kim, S.K., Hirasawa, M., Tripathy, J.N., Knaff, D.B., and Ubbink, M. (2009/12) Ternary protein complex of ferredoxin, ferredoxin:thioredoxin reductase, and thioredoxin studied by paramagnetic NMR spectroscopy, *J. Am. Chem. Soc.*, 131, 17576-17582.

Chung, J.S., Noguera-Mazon, V., Lancelin, J.M., Kim, S.K., Hirasawa, M., Hologne, M., Leustek, T. and Knaff, D.B. (2009/11) The Interaction Domain on Thioredoxin for *Pseudomonas aeruginosa* 5'-adenylylsulfate Reductase, *J. Biol. Chem.*, 45, 31181-31189.

Kim, S.K., Sims, C.L., Wozniak, S.E., Drude, S.H., Whitson, D., and Shaw, R.W. (2009/10) Antibiotic resistance in bacteria: novel metalloenzyme inhibitors, *Chemical Biology & Drug Design*, 74, 343-348.

Yoon, M.Y., Park, H.Y., Park, H.C., Park, S.H., Kim, S.K., Kim, Y.C., Shin, M., and Choi, J.D. (2009/07) Cloning and characterization of UDP-glucose dehydrogenase from *Sphingomonas chungubkensis* DJ77, *Bull. Korean Chem. Soc.* 30, 1547-1552.

Yoon, M.Y., Lee, K., Park, H.C., Park, S.H., Kim, S.G., Kim, S.K., and Choi, J.D. (2009/06) Cloning, expression, and characterization of UDP-glucose pyrophosphorylase from *Sphingomonas chungubkensis* DJ77, *Bull. Korean Chem. Soc.* 30, 1360-1364.

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Shipley, S.L., White, E., and Kim, S.K. (2010) Selection of Aptamers against live *E.coli* cells using Cell SELEX, The 2010 Annual American Society for Biochemistry and Molecular Biology (ASBMB) meeting, April 23-28, 2010 Anaheim, California

Schlesinger, S. R., Kim, S. G., Lee, J. S., Knaff, D. B., Lee, S. Y., and Kim, S. K. (2010) Redox properties of a thioredoxin-like *Aradopsis* protein, AtTDX, 239th American Chemical Society National Meeting and Exposition, March 21-25, San Francisco, California.

Kim, S. G., Chung, J. S., Lee, J. S., Wood, M. J., Knaff, D. B., and Kim, S. K. (2010) Redox properties of arsenate reductase from *Synechocystis* sp PCC6803, 239th American Chemical Society National Meeting and Exposition, March 21-25, San Francisco, California.

Lee, J. S., and Kim, S. K. (2010) Discovery of a new class of 3'-phosphoadenosine-5'-phosphosulfate reductase from the methanarcheon *Methanocaldococcus jannaschii*, 239th American Chemical Society National Meeting and Exposition, March 21-25, San Francisco, California.