Science and language challenges combined

Boston student at the Karlsruhe Institute of Technology

Eric Schmitt

***Eric Schmitt* is a student at *Boston College* where he studies Biology. He was incredibly happy that the *USA Interns program* of the *Steuben-Schurz-Society* could offer him an internship for the summer of 2014 at the *Karlsruhe Institute of Technology (KIT)* that combined work for his Major and practice in the language of his choice.**

At the end of my Freshman year in college, I was offered an internship in the research team of *Dr. Pavel Levkin* at the *Karlsruhe Institute of Technology's Institute for Genetics and Toxicology* in Germany. My internship work contributed to Dr. Levkin's new project, starting in 2014, entitled "*DropletMicroarrays: Ultra High-Throughput Screening of Cells in 2D Microenvironments*".

This was a great opportunity for me for two reasons. One, as a freshman biology student, research work is hard to find and very competitive. To have a chance to work at such a great lab with professional biologists was an honor. The second reason why it was such a great opportunity was because I was able to practice German, a language that only a dozen people in my university could properly speak. I was born in Germany, but moved before I had really mastered the whole language. Now I finally had the chance to improve not only my writing, but also my speaking.

Micro-plate technology has been used since the 1950s for biological research and diagnostic testing. A micro-plate contains many "wells" arranged in matrix format on a flat plate. These "wells" act as test tubes and hold liquid or other samples for testing. Specifically to support live cell testing, a new generation of micro-plates treated with tissue cultures were developed, which have a hydrophilic surface in order to enable cells to adhere to their surface. Micro-plate technology is currently the major form of live cell screening. Micro-plate technology, however, has a number of challenges. Specifically, this test method is invasive, cumbersome, and difficult to automate. Moreover, it has a very high cost, and cross contamination is also a constant risk. In order to make live cell testing more available to a larger set of researchers, a lower-cost, less maintenance-intensive solution is needed for live cell diagnostic testing.

At the Karlsruhe Institute of Technology, I joined a research project looking for a solution. The goal of this project is to demonstrate the use of superhydrophobic-superhydrophilic microarrays as a new technology for live cell-based testing. This new technology would address some common challenges such as cross-contamination and automation. This high-density array technology would be a game-changing technology enabling more efficient and convenient testing based on live cell studies.

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Through my internship with this research team, I worked with cell cultures and cell screening tests and also learned about the production and applications of superhydrophile-superhydrophobe microarrays. As this project spans from 2014 to 2019, the project will cover both testing as well as new tools to support the new proposed microarray diagnostic test process.

I was especially excited to have the opportunity to participate in a research internship with *Dr. Pavel Levkin* at the *Karlsruhe Institute of Technology*, as this institute has world-famous research projects in Biology, my planned field of study. One of my key motivations to select Biology as my major is that I want to contribute to improving our way of life through medical advancement.

I see *Dr. Levkin's* research as a key technology to empower researchers all over the world, enabling them to complete their research more efficiently, in shorter time, and at less cost. Through this internship, my work will be a small contribution to potentially a ground-breaking technology which will be a cornerstone of future biological research, and this is a tremendous intellectual challenge for me. On a personal level, the opportunity to interact and be mentored by *Dr. Levkin's* research team will help me develop not only technical skills but the mind set and dedication I need to be successful in initiating and executing my own research projects in future.

At the same time, being located in Germany, this internship also helped me enhance my scientific and practical German vocabulary. I was born in Germany, and although I have lived in America for most of my life, I have a lot of pride in my heritage. Before coming to *Boston College*, I had taken several German courses throughout high school, and this allowed me to jump to Intermediate German upon arrival.

While in Boston College, I have taken advanced German classes in both Intermediate German 1, and Intermediate German 2. I have also regularly read German newspapers and scientific journals in order to improve my vocabulary and familiarize myself with current topics in Germany. By completing an internship in Germany, I was able to bring my language skills to a near-native level and to enable my technical German knowledge in the Biological and Chemical sciences to a level which would enable me to pursue further study in German research institutions and companies.

Essentially, this was a great opportunity to improve both my Biology and German skills. As a freshman, I was very excited that I could be a part of such a promising scientific research project this early in my Boston College career which will help me become a better researcher and a more successful student. Thank you very much for all your help.

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