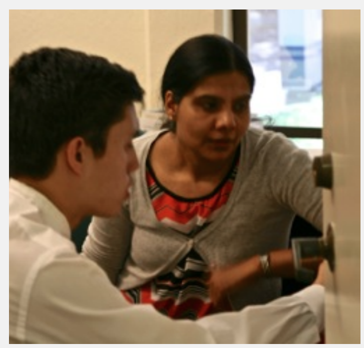
HIGH SCHOOL STUDENTS IN SOUTH BAY BECOME SUMMER SCIENTISTS

BACK

Eleven high school students from three South Bay high schools spent five weeks as full-time scientists in the Molecular Medicine Research Institute (MMRI) in Sunnyvale this summer, working on projects as diverse as analyzing changes in caffeine concentrations to quantifying levels of RNA in cell samples treated with LPS. This innovative program matched high school students with college student interns ("junior mentors") and senior scientific mentors (MMRI staff or "affiliate" entrepreneurs), providing a multi-level teaching and learning opportunity for all involved.



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The MMRI Summer Research Program for High School Students is one in a series of visionary programs developed by MMRI Chairman and Executive Director, Edward P. Amento, MD. Dr. Amento, who has a rich and fascinating background in academia, entrepreneurship and the non-profit world, wished to host high school students at the research institute out of a desire to inspire students to pursue science careers: "Kids need to be exposed to real science. We need them. Science shouldn't be something lofty or unapproachable".

Shivani Reddy and Samaan Faridjoo, both rising seniors from Homestead High in Cupertino, were paired with Dr. Desmond Mascarenhas, affiliate member MMRI, serial entrepreneurial scientist and founder of Transporin, and worked on a project aimed at stopping the expression of two genes controlled by Raf-1, research ultimately targeting cancerous growth. Shivani,

who aspires to become a cardiac surgeon, compared her summer experience at MMRI to her science labs in class: “In class, the experiences are vicarious. Here, I got to be in a real lab getting the full behind-the-scenes experience.” She added that “a lot of the techniques aren’t as hard as they sound once you do them.” Samaan chimed in, “We were able to go much more in depth with the science here at MMRI.” Agreeing with Shivani’s last comment, he added this caveat: “Sometimes the overview sounds so simple, but once you get into it, you realize that it takes a lot of detailed planning. If you mess up, it can ruin weeks of work.”

Dr. Jan Rydzewski , Director of Analytical Chemistry at MMRI, and Dr. Puja Ravikumar, a molecular biologist who recently joined MMRI, served as senior mentors to students. Senior mentors typically gave students questions to investigate along with detailed procedures. Students posed their own research questions, with senior mentors supporting and helping with analysis and write-up of results. Jan stated that the senior mentor role was to “build up students. We gave them detailed procedures. They decided how to use it.” Adding why she wanted to participate in the program: “It’s important to be able to share what we do. There are not that many opportunities for students to shadow a scientist.” Puja added, “Exposure at this age can be the differentiator. This can be the thing that hooks the students on science.”

Most of the day-to-day research supervision occurred under junior mentors. College intern Vaish Sridhar, a junior at UCSD studying neuroscience and pre-med, served as a junior mentor for Shivani and Samaan. She discussed both the teaching and learning value of the program: “The teaching part was very helpful to me. I hadn’t done many of the techniques in college yet. At times I had to do my own research to make sure I understood what was teaching.” Vaish and the all the other college students continued to intern at MMRI for the remainder of the summer.

The program brought in scientists to lead laboratory demonstrations on processes such as flow cytometry and to help students prepare their final posters and oral presentations. They benefited from the rich experience of the programs co-directors, Drs. Suparna Dutt and Mrinmoy Sanyal, staff scientists at Stanford, who with Dr. Amento formulated the structure of the program and served as key faculty for the students. The culmination of the summer session occurred when the students presented their oral presentations to MMRI staff and affiliates at their July 18 graduation, and their posters to a broader audience

of family members and staff that evening.

For some students, the program offered the first exposure to a research laboratory. Aayush Kothari, one of two sophomores in the program, had no chemistry background, but spent his time determining the most efficient way of synthesizing aspirin under the tutelage of Dr. Ankush Argade, an experienced medicinal chemist. “Synthesizing real medicine that you can buy in a store is really cool”, he offered, adding “that he is pretty certain he is interested in a medical career”. Homestead High students Varsha Raghavan and Meia Alsup were also enthusiastic in talking about their MMRI experience. “We were able to delve deep into a research question that we only skim over in school,” said Varsha, whose project with Dr. Shweta Pahujani of MMRI used mouse spleen cells to measure the rate of production of a particular cytokine by T-cells in regulating immune responses. “Here we can actually see the application to the real world,” she added. Meia, who used high performance liquid chromatography to analyze caffeine concentrations in aging coffee beans, added “we weren’t just given a tested method like we are in school. We had to test a method again and again and analyze our results.” Meia submitted her project to the Siemens’ science fair competition for which she was chosen as a Siemens National Semifinalist.

Manmeet Kaur, a graduate of UC Berkeley, served as both a junior mentor with senior mentor Dr. Ajith Welihinda, Direct of Cell Biology at MMRI, and as the Program Coordinator. In addition to working with her students and senior mentor, Manmeet helped set up the research teams and prep students for their graduation presentations. “These students elected to be here every day, all day, to learn applied science techniques, “ said Manmeet. “We hope this will have a lasting impression on their scientific study as they head back to school and, ultimately, on their career choices.”