



HIPsters Focus On Math And Medicine

HIGH SCHOOL INTERNS GAIN EARLY EXPOSURE TO MOFFITT RESEARCH

In 2013, researchers in Moffitt's Integrated Mathematical Oncology (IMO) laboratories hosted a class visit from the Academy of the Lakes High School. They intended to show students how mathematical models can help researchers define and predict how cancer starts and grows – and even how best to treat it.

Little did the IMO staff realize that the visit's result would be a new internship program for high school students – and a chance to introduce enthusiastic young learners to an emerging career path in mathematics.

One of the visitors that day – a 14-year old named Pranav “Raj” Warman – wanted a chance to put his mad math skills to work during the summer months. He would have to wait until he was 16 – and until Heiko Enderling, Ph.D., director of education and outreach in Moffitt's IMO Department, could formalize a program now known as HIP-IMO, for High School Internship Program in Integrated Mathematical Oncology.

Dr. Enderling recalls he barely had the program set up back in 2015 before 17 online applications came in – some from as far away as California and Minnesota. “I don’t know what these kids were doing – maybe Googling ‘unpaid summer program in mathematics and cancer’ - but if there are so many kids that want to learn, we want to teach them.”

They’re called “HIPsters” – as many as ten rising high school juniors and seniors who spend eight weeks throughout the summer at Moffitt’s Stabile Research Building. “We don’t ask for transcripts. We don’t really care what the kids have done in school,” says Dr. Enderling. “We aren’t going by grades but by interest - not just a great student, but a student that we can help learn the most.”

For the first week, they attend lectures. “Cancer biology 101, mathematics 101, some computer programming tutorials,” Dr. Enderling details, “but most of these kids have pretty solid background knowledge. We truly only get the crème de la crème.”

The rest of the summer is spent working with an IMO mentor on a defined project that matches their interests and abilities. The project has to include stated deliverables within six to eight weeks, and there’s a presentation to peers, faculty and parents at the end of the summer.

The first HIPster – Pranav Warman – not only completed his project but also set up a novel ongoing study with his mentor, IMO Associate Member David Basanta, Ph.D. Warman developed a simple mathematical model based on Game Theory to model biological systems, and to quickly identify alternative treatments that might have potential for cancer patients.

“Our goal is to get it published this year,” says Warman, who is now pursuing a math degree as a Duke University freshman with a full scholarship. He still stays in touch with fellow HIPsters through Facebook. “I gained friends and mentors for life,” he says. But the greatest impact of HIP-IMO is his continued interest in mathematics and biology. “This is such an exciting field – in the next 20 years, it will shape how we view things. The idea that it can inform treatments for cancer patients is inspiring to me.”

What’s inspiring to Dr. Enderling is the opportunity to expand the now shallow pool of trained scientists who are bilingual in the languages of math and medicine. “It’s an opportunity to spark a little light and see them run with it,” he says. To do that, he says, you need to reach students while they are still planning for college and beyond.

Dr. Enderling adds - while the program can be a gateway into a science career, it’s also a place where these students may finally fit in. “Most of them don’t have peers in their class or in their school. A lot of them already have done all college level



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math courses. And they push each other. If someone has a new idea and takes it to the next level, everybody tries to catch up.”

Good luck for most of the parents, says Dr. Enderling, who often grow teary-eyed while listening to their teen present scientific findings at the end of the summer.

“I know there are many teens who have great talent for this type of research,” adds Warman. “But they haven’t realized the potential. They need to hear about opportunities to gain exposure to it – and it is right here at Moffitt.”

The HIP-IMO program has already selected its interns for summer 2017, but you can learn more at: <http://labpages.moffitt.org/imo/hip-imo>. 