

OAK CREST INSTITUTE OF SCIENCE

science**news**



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Oak Crest to Assist in Organic Growth of Science Ecosystem



Elementary school students from the Monrovia Summer Extravaganza Program participant in science experiments designed by Oak Crest staff researchers and City of Monrovia Y.E.S. Program interns.

The Oak Crest Institute of Science and the City of Monrovia are organizations on a mission. The two have joined forces to serve as the catalyst for the development of a science hub in the San Gabriel Valley.

During a meeting held in early spring, Oliver Chi, Monrovia city manager, [Dr. Marc M. Baum](#), president and senior faculty at Oak Crest, and [Dr. Paul Webster](#), senior faculty at

Oak Crest, discussed how the two organizations could work together to develop a local area "Science Ecosystem" built on services, technology, research, and education.

Subsequent meetings between the City and Oak Crest have narrowed the focus of the Science Ecosystem, by seeking to develop services and programs in four primary areas including: Education, Workforce Development, Established Companies and Start-Up Companies. "Creating a science-friendly community begins with education.

Collaborations with the City of Monrovia make it possible for us to reach large numbers of students during the summer months, and during the school year. Our program will deliver the important skills development and research experiences students need to develop an interest in the STEM field," says Dr. Webster. "I believe Oak Crest is an ideal partner to help the city of Monrovia organically grow a Science Ecosystem in the San Gabriel Valley," says Dr. Baum. "We have numerous contacts in the

News & Events

Oak Crest Expands Summer Educational Opportunities

The summer months are often thought of as a time when life slows down a bit. Such was not the case at the Oak Crest Institute of Science. This summer 22 new faces graced the hallways and laboratories at Oak Crest. These faces belong to students who were eager to learn about the fascinating world of science.

The 2017 summer internship programs at Oak Crest began in mid-June and ran through the first week of August. Organized by [Manjula Gunawardana](#), senior research scientist, and [Dr. Paul Webster](#), senior faculty at Oak Crest, participants from local area high schools including Arcadia, El Monte, La Canada, Loyola and Monrovia learned laboratory skills in biochemistry, molecular biology, microbiology and imaging. An additional feature of this year's program was an intensive program of lectures presented by Oak Crest faculty and staff, covering a wide variety of practical and theoretical subjects.

As a result of discussions with the

science and technology field; we have a clear understanding of the difficulties encountered by small companies and we have valuable resources available for sharing. This partnership enables us to achieve our mission to educate the next generation of scientists and allows the city of Monrovia to establish itself as a hub for science, technology and innovation. This truly is a win/win for everyone," he adds. (See related article in News & Events.)

Annual IPCP Meeting Focuses on Successes and Challenges of HIV Prevention Research



U-19 meeting participants enjoy their lunch break at Clockers' Corner at Santa Anita Park.

At first the event seemed more like a family reunion than a scientific research meeting. Chemists, microbiologists, medical doctors and postdoctoral researchers from across the United States greeted each other like old friends as they gathered for the third annual U19 meeting supported by the Integrated Preclinical/Clinical Program for HIV Microbicides and Biomedical Prevention (IPCP-MBP) of the National Institute

of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health.

Hosted by [Dr. Marc M. Baum](#), president and senior faculty of the Oak Crest Institute of Science, the three-day annual meeting was held May 3-5, 2017 in and around Oak Crest's new hometown of Monrovia, CA. The third annual U-19 Meeting focused on the research, testing and efficacy assessment of a novel pod-intravaginal ring (IVR) capable of delivering one or more potent antiretroviral drugs with the goal of preventing HIV acquisition in women.

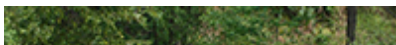
Funding for this five-year grant project was awarded to Oak Crest in 2014 under the Integrated Preclinical Clinical Program for Microbicides and Biomedical Prevention (IPCP-MBP), a grant (U19 AI 113048) that funds collaborative projects through the U19 cooperative agreement mechanism involving multiple institutions. Oak Crest is the lead institution in this [\\$20 million grant](#).

The first full day of meetings took place at historic [Santa Anita Park](#), a thoroughbred racetrack in Arcadia, CA, just 10 minutes from the Oak Crest facilities. Opened in December 1934, Santa Anita offers some of the most prominent racing events in the U.S. during the winter and spring. With its backdrop of the San Gabriel Mountains, it is considered by many to be the world's most beautiful racetrack.

Presentations that day included an introduction by Dr. Baum with a program overview by Dr. Jim A. Turpin, program officer and chief of the Preclinical Microbicides and Prevention Research Branch in the Prevention Sciences Program of the Division of AIDS at NIAID. Additional team members from Oak Crest, Johns Hopkins University School of Medicine and the University of Texas Medical Branch made presentations on the formulation, pharmacokinetics, safety, efficacy, exploratory clinical trials and Good Manufacturing Practice (GMP) of the pod-IVR throughout the remainder of the day.

"Development of our pod-IVR has come a long way in the last three years. The novel and versatile drug delivery system that our team is developing has proven that it has the capacity to deliver and maintain protective levels of multiple drugs," says Dr. Baum. "We are now beginning clinical trials in humans and expect to gain valuable feedback from the women who are involved in the study," he adds.

Day two of the team presentations took place at the



As a result of discussions with the City of Monrovia aimed at developing science technology and education in the local area, Oak Crest opened its doors to two new and interconnected programs. Two students who joined the City of Monrovia's Youth Employment Services (Y.E.S.) Program were seconded to Oak Crest where they were tasked with working with two Oak Crest staff researchers, Amalia Castonguay and Mackenzie Anderson, to develop a summer science camp program. Using regular household items and foodstuffs they are developing simple experiments to illustrate basic chemical, physical, and biological principles.

Together with a team of Oak Crest staff members, the YES interns tested their experiments with groups of elementary and middle school students from the Monrovia Summer Extravaganza Program. Each Friday afternoon a group of students arrived at Oak Crest, watched a program of science-based demonstrations, participated in their own experiments, and took a tour of the Institute. This collaboration has been made possible by discussions between Dr. Marc Baum, Dr. Paul Webster, and the Monrovia City Manager, Oliver Chi. Organizational duties were carried out by Tina Cherry, Public Services Director, Katie Distelrath, Recreation Manager, Brooke Putich, Recreation Coordinator, and the team of camp counselors who escorted the teams each week.

Internships for community college students included those from Citrus College, Pasadena City College, Mt. San Antonio College and Rio Hondo College. Studies for these students focused on higher-level research including the development of long acting drug delivery systems and the prevention of sexually transmitted HIV in women.

"Our summer internship programs clearly align with the Oak Crest mission to cultivate tomorrow's scientists one individual at a time," says Manjula Gunawardana. "Sharing our passion for science with these young people brings joy, energy and excitement to our lab. It's a great experience for all who are involved."

YES Program Participants Complete Internships

Ceballos, Enrique and Ceballos,

presentations took place at the [Monrovia Canyon Park Cabin/Conference Center](#) nestled in the hills above the city. This scenic venue sits on 80 acres with trails, a waterfall, lush vegetation and local wildlife. "This remote location provided the perfect backdrop for our closing day," says Dr. Baum. "The team was able to enjoy the solitude and beauty of nature while conducting important presentations on cutting-edge technologies being used in our efforts to stop the transmission of HIV."



Philippe Gallay left, from The Scripps Research Institute and Hans Spiegel, from the National Institutes of Health, discuss progress on the NIH U-19 grant project during the final day of presentations.

Team member Dr. Rick Pyles, professor of Pediatrics and Microbiology and Immunology, University of Texas Medical Branch summed up the event this way:

"To interact so closely with chemists and folks who almost speak a different language to mine has been something I never thought I would embrace. It really is a fellowship of researchers that have this natural affinity to share and openly discuss each other's information ultimately bringing each other forward in our own fields but also in each other's fields. With this group I've had so many ah-ha moments that clarify difficulties in advancing a finding to the next best experiment. Participation on this team has helped me grow personally and professionally. I'm really thrilled to be part of *The Fellowship of the Ring*."

The views expressed are those of the Oak Crest Institute of Science and its leadership and do not necessarily reflect the official policies of the Department of Health and Human Services (HHS), nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

The Expanding Fight Against HIV

[Dr. John Moss](#), senior faculty at the Oak Crest Institute of Science, is a very busy man these days. During the past six months he has been helping spread the word across the country and throughout the world about the promising steps that are being made in HIV prevention research.

In April, Dr. Moss presented a poster at the 253rd American Chemical Society (ACS) National Meeting & Exposition in San Francisco, CA. The meeting, which focused on advanced materials, technologies, systems and process, attracted more than 17,200 researchers and scientists from around the world.

The poster entitled "The Impact of pH on Solubility, Hydrolysis Kinetics, and Pharmacokinetics of Tenofovir Disoproxil Fumarate Delivered from Intravaginal Rings" highlighted the need to better understand the lack of correlation between in vitro and in vivo behavior. "Understanding the pH dependent effects is important for preclinical and clinical studies to determine TDF concentrations in the relevant compartments (vaginal fluids, tissues, blood, and associated CD4+ cells) that are effective in preventing HIV infection," comments Dr. Moss.

In addition to this poster presentation, research findings reported by Dr. Moss, Oak Crest researchers and various collaborators, was highlighted in the 10th Anniversary issue of PLoS One. The paper entitled "[An Intravaginal Ring for Real-Time Evaluation of Adherence to Therapy](#)," was among a selection of articles chosen by Senior Editor Renee Hoch to illustrate how innovative research spanning several disciplines has contributed to scientific progress over the past decade.

This open access article illustrated how a miniature, low-cost IVR device using readily available electronic components, can provide accurate and quantitative determination of adherence to IVR-based HIV prevention methods. "Adherence has been shown to be a primary factor in pre-exposure prophylaxis microbicide clinical trial failures," explains Dr. Moss. "Adherence monitoring may allow more accurate evaluation of product

Gabriela Fajardo and Gabriela Macias have something to smile about. . .the two recently completed their internships at the Oak Crest. The girls, both high school students at Monrovia High School, participated in a 10-week program at Oak Crest helping staff researchers develop and test curriculum ideas for a full-scale Summer Science Program for elementary and middle school students next year. The girls were selected from more than two-dozen applicants who are part of the City of Monrovia's Youth Employment Services (YES) Program.

In 2007 the City of Monrovia partnered with the Santa Anita Family YMCA, Monrovia Unified School District and Monrovia Chamber of Commerce to develop and launch the YES Program, which has three main goals:

1. Ensure Monrovia's continued success as a regional employment hub;
2. Provide on-the-job training and life skills to Monrovia youth; and
3. Establish a path toward a job and/or college and life readiness for local youth.

A big "thank you" goes out to both girls for their assistance in developing and testing new curriculum for Oak Crest's Summer Science Program!

Upcoming Summer Series

The next Oak Crest monthly seminar will be held Wednesday, September 6, at 4 p.m. in the laboratory's main conference room. Dr. Yangyang Liu, assistant professor of Chemistry, Department of Chemistry and Biochemistry at California State University, Los Angeles will be the guest speaker. Dr. Liu's research interests include materials chemistry, inorganic chemistry, catalysis, renewable energy and nanotechnology. Make plans to attend. Mark your calendar today!!

efficacy, identify factors influencing product use, and enable early interventions to ensure successful preventative therapy. Based on the initial in vitro and in vivo results presented in this paper, this adherence-monitoring IVR merits further development and evaluation in preclinical and clinical studies," he adds.

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ANNOUNCEMENTS

RESEARCH, PUBLICATIONS AND SPECIAL EVENTS Publications

Congratulations to the following Oak Crest faculty and collaborators for the recent publication of their scientific papers:

Chunxia Zhao, [Manjula Gunawardana](#), Francois Villingier, [Marc M. Baum](#), Marlana Remedios-Chan, Thomas R. Moench, Larry Zeitlin, Kevin J. Whaley, Ognian Bohorov, Thomas J. Smith, Deborah J. Anderson and [John A. Moss](#). *Pharmacokinetics and Preliminary Safety of Pod-Intravaginal Rings Delivering the Monoclonal Antibody VRC01-N for HIV Prophylaxis in a Macaque Model*. Accepted manuscript posted online 17 April 2017, doi:10.1128/AAC.02465-16AAC.02465-16

[Moss J.A.](#), [Baum M.M.](#), Easley J.T., Cox D.M., Smith T.J. (2017) *An Intravaginal Ring for Real-Time Evaluation of Adherence to Therapy*. PLoS ONE 12(4): e0174729. <https://doi.org/10.1371/journal.pone.0174729>