Monell Science Apprenticeship Program

Summer 2019 Program

Report to the Community

Monell Chemical Senses Center

2019 Apprentices
Overview

The Monell Center is proud to report on the 38th annual Monell Science Apprenticeship Program (MSAP). This eight-week internship continues to inspire young people to pursue science education and careers in the biomedical sciences by providing apprentices with high quality, hands-on learning experiences in a professional laboratory setting.

Our mission is to provide Philadelphia area students — especially those from groups underrepresented in the sciences — opportunities to engage in scientific discovery through laboratory-based biomedical research. This mission is deeply rooted in a commitment to the Philadelphia community and to training the next generation of scientists and STEM (Science, Technology, Engineering, and Medicine) professionals.

The 2019 application pool was impressive and made the committee’s job of selecting candidates a challenge. We received 221 applicants this year and accepted a total of 11 apprentices (also known as SAPlings). These high school and undergraduate students joined the Monell scientific community for eight weeks (June 17 - August 9, 2019), working directly with PhD- and MD-level scientists and highly skilled lab staff and technicians.

The MSAP Executive Committee is committed to providing each student with a unique summer internship experience. Unlike other internships, MSAP employs a mentor-apprentice model that is designed to provide SAPlings with high quality technical training, science education, and accessible role models who can help guide apprentices in their academic and professional pursuits.

The Committee carefully matches each SAPling with a full-time scientist mentor, and apprentices work closely with the primary investigator and lab staff on an independent research project.

Each apprentice conducts their own research while immersed in a rich, hands-on learning environment that fosters technical skill-building and developing a thorough understanding of basic scientific principles.
Apprentice success hinges on proper education and training, and mentors, in conjunction with Monell’s Human Resource Department, are responsible for ensuring that apprentices receive appropriate training and follow all safety procedures.

Apprentices become part of the lab staff and attend and contribute to lab meetings and other routine laboratory activities. Many mentors make an effort to meet with their apprentice at least once a day to answer questions and provide guidance. We require a minimum of two one-on-one meetings per week with the principal investigator.

As supervisors, mentors answer daily activity questions, assist with day-to-day problems, and confirm that lab notebooks are used correctly. Other lab members, such as postdoctoral fellows and lab technicians, contribute to SAPlings’ overall mentorship throughout the eight weeks.

Providing apprentices with proper supervision and resources ensures that they have a complete understanding of the hypotheses and research objectives of their individual projects and of the mentor’s larger research program. The Capstone Symposium — where the apprentices present their research — reflects this comprehensive understanding, which is critical to learning and understanding.

“Science is more than a school subject, of the periodic table, or the properties of waves. It is an approach to the world, a critical way to understand and explore and engage with the world, and then have the capacity to change that world…”

-President Barack Obama

“If we want more STEM graduates, then we must promote ideas, language, people, and programs that demonstrate relevance and foster a sense of belonging.”

-Barbara McAllister, Director of Strategic Initiatives and Planning, Intel Corporation
It is our great pleasure to thank those who made the 2019 Monell Science Apprenticeship Program possible. Organizations, agencies, and individuals who donated to MSAP 2019 are listed below.

### Monell Circle ($1,000+)

- Altria Client Services
- Robert Bedoukian, Bedoukian Research, Inc.
- Paul Breslin
- Jennifer Douglas
- The Ellis Trust for Girls
- Janssen Global Services
- John Labows
- The Christopher Ludwick Foundation
- The Wawa Foundation

### Other Donors

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<td>Grace</td>
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Name: Aurora  
School: William Penn Charter School  
Lab: Reed Lab  
Mentors: Danielle Reed and Lauren Colquitt  
Project: Testing polarizing foods based on big-data analysis of Amazon food reviews

“I found out that I am more interested about science than I thought.”

Name: Simone  
School: Science Leadership Academy  
Lab: Dalton Lab  
Mentors: Pamela Dalton and Molly Spencer  
Project: Spice Spice Baby: Spice Perception and Testosterone by Chili Use and Gender

“While working with my mentor, I realized that I really do have a love for science. I confirmed that by experiencing the different studies going on in my lab, and the intriguing facts that would come up when with them.”

Name: Kepler  
School: Clearview Regional High School  
Lab: Reisert Lab  
Mentors: Federica Genovese  
Project: Characterizing the Electrophysiological Response to Irritants within the Olfactory Epithelium

“I learned way more about biology than I had anticipated and I’m happy for that!”
**Name:** Mariella  
**School:** Chestnut Hill College  
**Lab:** Ozdener Lab  
**Mentors:** M. Hakan Ozdener  
**Project:** Sophorolipids Reduces Bitter Taste of Malaria & HIV Drugs

“Scientists ask questions and try to find answers to those questions by means of experiments.”

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**Name:** Marisa  
**School:** Miss Hall’s School  
**Lab:** Tordoff Lab  
**Mentors:** Genevieve Bell  
**Project:** Are Intestinal Organoids a Good Model of Diet Induced Changes in the Gut?

“I found out that I would really like to do biomedical research.”

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**Name:** Sarah  
**School:** Linden Hall School for Girls  
**Lab:** Zhang Lab  
**Mentors:** Yali Zhang, John Mack, and Tingwei Mi  
**Project:** Examining the Neural and Molecular Basis of Food Texture Sensation

“I found that I have a right to be confident in my abilities and that I want to go into research.”
Name: Tahlia  
School: The Workshop School  
Lab: Mainland Lab  
Mentors: Joel Mainland, Emily Mayhew, Marissa Kamarck, and Nicolle Murphy  
Project: Defining Odor Quality

“I knew myself, I am just at the point of perfecting it. Monell has helped me with that.”

Name: Hannah  
School: The Philadelphia High School for the Creative and Performing Arts  
Lab: Preti Lab  
Mentors: George Preti and Young Eun Lee  
Project: Examining Volatile Organic Compounds From Abnormal Tissue Growth: Ovarian Cancer

“My personal/summer achievements of the program were that I had the ability to actually quantify samples and understand the reasoning behind my project and why it works, and I was able to present a project that is finding a way to early detect ovarian cancer!”

Name: Maab  
School: Central High School  
Lab: Wise Lab  
Mentors: Paul Wise  
Project: Block the Bitter: Using Sophorolipids to Suppress Bitter Taste in Malaria & HIV Drugs (Pilot Study)

“I learned a lot about taste perception and unexpected faults in experiments while working with human subjects.”
The Program

The foundation of the MSAP experience is conducting hands-on bench research alongside professional scientists. Each year the MSAP Executive Committee carefully plans additional enrichment activities designed to supplement the apprentices’ laboratory work.

A popular seminar series has been a key part of the program for several years. This series exposed SAPlings to a wide range of STEM-related fields — including government, industry, and the media.

Monell postdoctoral fellows organize enrichment activities including discussions of how to read and prepare scientific articles, journal club gatherings featuring in-depth discussions of select scientific articles, a roundtable discussion about education and career paths, and a day of “Open Labs” during which apprentices can observe the various biomedical disciplines practiced in Monell’s labs.

Open Labs day is a popular event for the apprentices. They get to choose from four demonstrations: assessing olfactory detection thresholds in a research setting; examining odor coding and perception in human olfaction; measuring sweet taste hedonics; and fluorescence microscopy, a look into the nose.

MSAP also includes a professional development component in the enrichment programming. The professional development seminar this year, led by Monell’s Senior HR Generalist Jessey Baker, included an instructional lecture aimed at helping SAPlings build interview and professional communication skills.

Also included in this year’s programming were the following enrichment lectures: “Science Communication” and “How to Create and Present Scientific Posters”. Taken in tandem, these seminars were designed to better prepare SAPlings to create and present their research and results at the Capstone Symposium.
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<th>Date</th>
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<td>Mon. June 17</td>
<td>9am – 10:30am</td>
<td><strong>Program Kickoff and Welcome</strong></td>
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| Thurs. June 20 | 11am – 12pm    | **Lecture 1:** Federica Genovese & Emily Mayhew, Monell Postdoctoral Fellows in the Reisert & Mainland Labs  
**Title:** “Intro to Taste and Smell” |
|              | 4pm – 5pm       | **Popsicle Social** – with Pops from The ‘Lil Pop Shop.**             |
| Fri. June 21 | 12pm – 1pm      | **Enrichment Seminar:** Dolly Al-Koborssy, Monell Postdoctoral Fellow in the Reisert Lab  
**Title:** “How to Read a Paper” |
| Mon. June 24 | 2pm – 3pm       | **Lab Safety Training Session**                                       |
| Thurs. June 27 | 11am — 12pm    | **Lecture 2:** Ellen Le, MSAP alumna and MBA at Harvard University  
**Title:** “Designing a Career” |
| Fri. June 28 | 12pm – 1pm      | **Enrichment Seminar:** Jessey Baker, Senior HR Generalist at Monell  
**Title:** “How to Interview” |
| Mon. July 1  | 12pm-1pm        | **Journal Club** with Alissa Smethers, Monell Postdoctoral Fellow in the Mennella Lab |
| Tues. July 2 | 11am – 12pm     | **Lecture 3:** Joel Mainland, Associate Member, Monell  
**Title:** “Methods of Rationality” |
| Tues. July 9 | 11am — 12pm     | **Enrichment Seminar:** Alan Leshner, CEO Emeritus, American Association for the Advancement of Science  
**Title:** “Science Communications” |
|              | 12pm – 1:30pm   | **Networking Lunch** @ Savas Pizza                                    |
| Thurs. July 11 | 11am— 12pm    | **Lecture 4:** Paul Breslin, Member, Monell  
**Title:** “Philosophy of Science” |
| Thurs. July 18 | 11am – 12pm    | **Lecture 5:** Daniel Ludlum, Flavorist at Symrise  
**Title:** “Flavorist Training 2016-2018” |
| Fri. July 29 | 12pm – 1pm      | **Enrichment Seminar:** Joel Mainland, Associate Member, Monell  
**Title:** “How to Present a Poster” |
| Tues. July 23 | 12pm – 1pm      | **Journal Club** with Molly Spencer & Genevieve Bell, Monell Postdoctoral Fellows in the Dalton and Tordoff Labs |
| Thurs. July 25 | 11am – 12pm    | **Lecture 6:** Sama Ahmed, MSAP Alumnus and Princeton Presidential Postdoctoral Fellow  
**Title:** “Moving and Grooving: The Brain of a Singing Fly” |
| Fri. July 26 | 12pm – 1pm      | **Enrichment Seminar:** Led by Monell Center Postdocs  
**Title:** “Postdoc Panel” |
| Thurs. Aug 1 | 11am – 12pm     | **Lecture 7:** Paul Breslin, Member, Monell  
**Title:** “A Nutrition Primer” |
| Fri. Aug 2  | 11am – 12pm     | **Open Labs**                                                        |
| Thurs. Aug 9 | 3pm – 5pm       | **Final Symposium:** Student poster presentations                    |
The Capstone Presentations mark the end of the program. SAPlings present the results of their research and learning to family, friends, and fellow scientists at a conference-style poster session. This year the event was attended by over 100 people, including the apprentices’ families, Monell scientists and staff, local legislators, donors, and several MSAP alumni.

The Capstone Celebrates the apprentices’ accomplishments during a summer full of hard work and discovery. It is a very proud moment for the apprentices, their mentors, and especially their families. Each apprentice creates a scientific poster using the data they have analyzed, graphed, and tabulated. The posters describe their hypotheses and results, and SAPlings give oral presentations in a conference-style environment to the Capstone guests.

This event is an excellent opportunity for apprentices to exercise their science writing and presentation skills and learn how to deliver their results to a diverse audience. Apprentices also learn how to engage in academic exchange by demonstrating that they understand: i) their hypothesis, ii) why their research question was asked, iii) whether their data support their hypotheses, and iv) what this work means in the broader context.

The ninth annual “Monell Sense-ational Science Award” for best project was chosen by a panel of Monell staff. This year’s recipient was Kepler, who worked in the Reisert Laboratory. His project was titled, “Characterizing the Electrophysiological Response to Irritants within the Olfactory Epithelium". Congratulations, Kepler!