ACS Chemistry for Life®

SCALACS

A Publication of the Southern California Section of the American Chemical Society

VOLUME LXXXI/No. 1 JANUARY/FEBRUARY 2026

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CHAIR'S MESSAGE

Dear SCALACS members,

I hope this message finds you well and that the new year is off to a happy start. I am truly honored to have been elected to serve a second term as Chair of SCALACS and am deeply grateful for the continued support of our members.

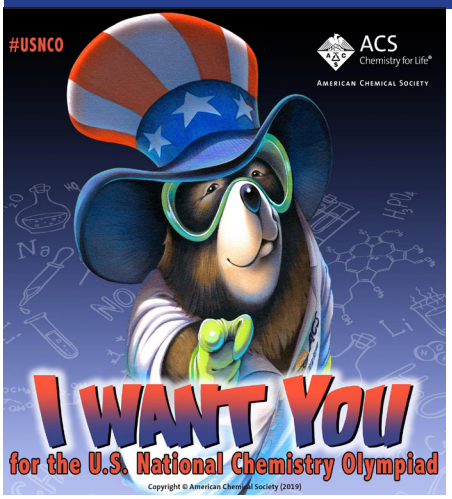
This time last year was especially challenging for many in our community who were affected by the Pasadena/Altadena and Palisades fires. I would like to take a moment to acknowledge those difficult experiences and express my hope that, as this new year begins, we can look ahead to healing and positive changes in our surroundings.

I want to express my gratitude to everyone who has contributed to the organization's activities over the past year. In particular, I want to recognize Veronica Jaramillo for having served a second term as SCALACS Chair. Her leadership has brought about new ideas for meeting, new ways for SCALACS members to connect, and creativity in leadership. I also want to recognize Barbara Belmont for her continued fearless leadership as Secretary/Treasurer of the organization. Kudos to Barbara for her many years of helping take care of so many facets of SCALACS. She has an amazing level of commitment and expertise. Peggie Chan, Danielle Fazzi, and Jenneva Guzman of Huntington Association Management have played vital roles in keeping our organization structured and informed. Without these three, we would not be able to run our events and keep members updated with new information. And of course, Krishna Kallury, who continues to work toward enhancing SCALACS by winning grants that enrich the lives of our members. Thank you to all the Executive Committee members whose enthusiasm during our monthly zoom meetings has enabled SCALACS to put on many creative undertakings in the past year. Welcome to all our newly elected members of the Executive Committee. Together, we all hope to organize fruitful experiences for our members.

Looking ahead to 2026, one of my goals as Chair is to offer as many opportunities as possible for members to connect and engage. At a recent dinner with the Executive Committee, we discussed hosting a variety of social gatherings for members in different areas throughout Los Angeles. To help make this happen, I hope to form a Social Gatherings Committee and would love members to join in planning these events. If you're interested in being part of this committee, please email me—I'd be delighted to hear from you! If any member has ideas for future events, please contact me or the SCALACS office. You may also reach me directly via email at eudell@westridge.org. I look forward to working with you this coming year.

Sincerely,
Edye Udell
Chair, SCALACS
Science Teacher, Westridge School
(EUdell@westridge.org)

USNCO REGISTRATION NOW OPEN!



Get Ready for the 2026 US National Chemistry Olympiad!

The SCALACS deadline for student registration for the 2026 U.S. National Chemistry Olympiad (USNCO) Local Exam: **Friday, January 23, 2026.** No exceptions or late submissions will be accepted.

Although the national ACS website lists February 27, 2026, as the registration deadline, that date applies only to ACS headquarters. Each local section sets its own deadlines, and SCALACS follows an earlier schedule to allow adequate time for exam distribution, proctoring coordination, and processing.

All SCALACS registrations must be completed by **Friday, January 23, 2026.**

Registration Link & Additional Support

Please have students or their parent/guardian register using this link: https://www.acs.org/education/olympiad.html

If your school has space and is willing to host individual students who do not have a testing site, please notify the SCALACS office at office@scalacs.org. Your support helps ensure that all eligible students are able to take the Local Exam.

Local Olympiad Exam Fees & Payment Information

Cost: $12 per student

If your school plans to cover the exam fees for your students and please notify the office before January 23, 2026. After registration closes, SCALACS office will send out the payment link to parents/guardians of individually paying students and invoices to schools covering costs. **The payment deadline is February 6, 2026.** Parents/guardians need to check the inbox of the email address that is submitted on the USNCO registration form for the payment link.

Local Exam Format, Mailing, and Dates

The 2026 SCALACS Local Exam will take place on **March 12 & 13.**

SCALACS will administer a printed exam. Exam packets will be mailed directly to the Olympiad teacher proctoring the exam. Teachers need to ensure that SCALACS office has your current and accurate mailing address, so exam materials arrive on time. Teachers will need to select which of the two dates they will be proctoring the exam at their school.

KEY DATES FOR 2026 USNCO EXAM

Schedule is subject to change. All changes will be posted on the USNCO website: https://www.acs.org/education/olympiad.html

January 23, 2026 – SCALACS Registration Deadline (no late submissions accepted).
January 23, 2026 – Deadline for schools to confirm if they are paying student exam fees.
February 6, 2026 – Payment Deadline for all students and schools.
March 12 & 13, 2026 – SCALACS Local Exam
April 10 - 19, 2026 – National Exam
May 31 - June 13, 2026 – Study Camp at the University of Maryland
July 10 - 19, 2026 – International Chemistry Olympiad (IChO) in Uzbekistan

Any questions, you may contact our SCALACS administrator, e-mail office@scalacs.org or call 310-327-1216.

2026 SCALACS GOVERNANCE ELECTION RESULTS

Our Election for 2026 SCALACS Governance has concluded. This election was processed by ElectionBuddy.com. We thank all other members who submitted their votes.

The SCALACS Elected Governance for 2026 is as follows:

Elected Officers:
CHAIR: Edye Udell
CHAIR-ELECT: Lucky Morales
SECRETARY/TREASURER: Barbara Belmont

Executive Committee Members at Large:
Sunhwa (Clarita) Joung (Jan. 2025 – Dec. 2027)
Krishna Kallury (Jan. 2025 – Dec. 2027)
Michael Morgan (Jan. 2026 – Dec. 2028)
Amaka Enueme (Jan. 2026 – Dec. 2028)
Spiros Garbis (Jan. 2026 – Dec. 2028)
Eric Kuenstner (Jan. 2025 – Dec. 2027)
Jessica Lu (Jan. 2024 – Dec. 2026)
Aaron Moment (Jan. 2024 – Dec. 2026)

Councilors:
Brian Brady (Jan. 2024 – Dec. 2026)
Robert de Groot (Jan. 2025 – Dec. 2027)
Veronica Jaramillo (Jan. 2026 – Dec. 2028)
Eleanor Siebert (Jan. 2025 – Dec. 2027)
Barbara Sitzman (Jan. 2026 – Dec. 2028)

Alternate Councilors:
Elham Fazelpour (Jan. 2025 – Dec. 2027)
Krishna Kallury (Jan. 2026 – Dec. 2028)
Thomas Mathew (Jan. 2025 – Dec. 2027)
Michael Morgan (Jan. 2026 – Dec. 2028)
Alexandros Oxyzolou (Jan. 2024 – Dec. 2026)

_____

Immediate Past Chair:
Veronica Jaramillo

Election Date: October 24 - November 21, 2025.
Election Vendor: ElectionBuddy.com
Submitted by and certified by Barbara Belmont, SCALACS Secretary/Treasurer

Holiday Recipes CONTEST

"Maillard-Magic Citrus Pan-Roasted Vegetables: A Holiday Reaction Pathway for Angelinos"

A culinary experiment demonstrating controlled thermal decomposition, browning chemistry, and nutrient stabilization.

INTRODUCTION (CHEMISTRY MEETS CUISINE)

This recipe celebrates the diverse chemistry of cooking while reflecting Southern California's equally diverse population. By leveraging core concepts like the Maillard reaction, emulsification, acid–base balance, and antioxidant stabilization, this dish transforms simple produce into a flavorful, colorful holiday medley. It is vegan, gluten-free, and built on local ingredients that Angelinos will recognize from their farmers markets.

INGREDIENTS (REAGENTS LIST)

Vegetable Matrix:

2 cups diced sweet potatoes
2 cups Brussels sprouts, halved
1 red bell pepper, chopped
1 yellow onion, sliced

Reaction Promoters:

2 tablespoons olive oil (lipid phase)
1 teaspoon sea salt (ionic seasoning agent)
½ teaspoon black pepper (aromatic organic molecules)
1 teaspoon smoked paprika (phenolic compound contributor)

Citrus Acid Catalyst System:

Juice of 1 large orange (ascorbic acid source)
Zest of 1 lemon (volatile terpene enhancer)
1 tablespoon apple cider vinegar (pH modulator)

Optional Stabilizers:

1 tablespoon honey or agave syrup (reducing sugar)
Fresh parsley, chopped (chlorophyll-rich garnish)

PROCEDURE (EXPERIMENTAL METHOD)

1. Pre-Heating Step (Energy Input Setup)
   Set the oven to 425°F (218°C). This temperature optimizes the Maillard reaction by providing sufficient activation energy for amino acids and reducing sugars on vegetable surfaces.
2. Substrate Preparation
   Place the sweet potatoes, Brussels sprouts, bell pepper, and onion on a baking sheet. Coat with olive oil to form a uniform hydrophobic layer that promotes even heat transfer.
   Dust with salt, pepper, and smoked paprika to introduce ionic and aromatic compounds that influence flavor perception.
3. Acid Catalyst Introduction
   In a small beaker (or bowl), combine orange juice, lemon zest, and apple cider vinegar. Pour over vegetables. The mild acidity prevents discoloration via antioxidant activity while brightening flavor through pH-dependent aroma release.
4. Controlled Thermal Reaction
   Roast for 25–30 minutes, mixing halfway through to prevent localized over-caramelization. Observe visual indicators: browning, aroma evolution, and softening of the matrix.
   If desired, add honey/agave during the final 5 minutes to increase reducing sugar concentration and intensify browning kinetics.
5. Final Stabilization
   Remove from oven and top with parsley. Allow to cool 5 minutes for volatile compounds to stabilize and flavor equilibrium to occur.

SCALACS was awarded an LSAC/DEIR grant for the 2024–2025 period to implement its proposal, **"Cultural Foods and Chemistry – a Symbiosis."** Under this grant, SCALACS organized a **Recipe Contest** for its membership to highlight the health benefits of cultural food preparations and to encourage an interactive exchange of holiday recipes. Submissions featured dishes representing Greek, Indian, and traditional American cultural heritage.

The top winners were Petr Vozka and Alexandros Oxyzolou, each received a US$100 gift certificate (recipes listed below). Runner-up gift certificates of US$50 each were awarded to Oliver Seely and Meera Iyer for their submission on Seely English Toffee and Oven-Roasted Potato Curry respectively.

DIET & NUTRITIONAL VALUE (COMPOSITION ANALYSIS)

Approximate values per 1-cup serving:

Calories: ~160 kcal
Carbohydrates: 24 g
Protein: 3 g
Fat: 6 g (primarily monounsaturated from olive oil)
Fiber: 5 g
Vitamin C: High (from citrus and bell pepper)
Vitamin A: High (from sweet potatoes)
Minerals: Potassium, manganese, folate
Free of: gluten, dairy, animal products, and common allergens (unless honey is used).

HEALTH BENEFITS (STRUCTURE–FUNCTION RELATIONSHIPS)

1. Sweet Potatoes – Beta-Carotene Reservoir
   Beta-carotene acts as a provitamin A molecule and antioxidant. Heating enhances bioavailability by disrupting cell walls.
2. Brussels Sprouts – Glucosinolate Chemistry
   Roasting promotes the formation of desirable sulfur-aroma compounds while retaining fiber beneficial for digestive health.
3. Citrus Juice – Ascorbic Acid Stability
   Vitamin C functions as a reducing agent that prevents oxidative degradation and supports immune function during cold and flu season.
4. Olive Oil – Liquid-Phase Lipid Transport
   Rich in monounsaturated fatty acids, olive oil supports cardiovascular health and facilitates absorption of fat-soluble vitamins.
5. Maillard Reaction Products – Flavor Engineering
   Non-enzymatic browning generates hundreds of heterocyclic compounds that deliver savory depth without added sodium or artificial flavoring.

CONCLUSION

This recipe blends culinary enjoyment with chemical principles, demonstrating how everyday cooking is a controlled orchestration of reactions. It is accessible, nutrient-dense, and reflective of the vibrant produce available year-round in Southern California. Most importantly, it brings chemistry to the holiday table in a way that is fun, clever, and delicious.

Submitted by:
Petr Vozka, Ph.D.
Associate Professor
Department of Chemistry & Biochemistry
California State University, Los Angeles

Continued on page 6.

Continued from page 5.

Recipe-Greek Avgolemono Chicken Soup

A culinary experiment demonstrating controlled thermal decomposition, browning chemistry, and nutrient stabilization.

INGREDIENTS

3 lbs of skinless chicken (breasts or thighs) or 1L chicken broth
1/2 cup of long-grain rice or orzo
1-2 eggs
1-2 small lemons
A pinch of salt and pepper to taste

INSTRUCTIONS

1. Rinse the chicken very well under cold water and place it in a pot and fill with cold water barely covering it. Bring it to a boil while skimming off with a ladle the foamed scum that rises to the top. Add a pinch of salt and pepper. Then cover the pot and simmer for about 40 minutes until the chicken is easily pierced with a fork. Strain the broth into another clean pot and set the chicken aside. (Alternatively you may use a ready-made chicken broth).
2. Bring the clean stock to a boil and add rice or orzo; stir well, cover, and simmer for about 20 minutes. (You may also add diced carrots and celery)
3. In another large bowl crack the eggs, squeeze in the lemons and whisk well to make an homogeneous mixture
4. Use a kitchen thermometer to measure the temperature of the hot chicken broth and then place the thermometer at the egg-lemon mixture. With one hand use a ladle to take a small amount of the broth and slowly and gently pour it over the egg-lemon mixture while with the other hand keep whisking the mixture. Keep adding small spoonfuls of the broth slowly until the temperature of the egg-lemon mixture slowly rises to that of the broth ensuring that the egg mixture has not curdled.
5. Slowly pour the mixture into the pot and keep whisking until you get an homogeneous soup. (You may add some shredded pieces of the chicken back to the soup) and gently warm it.
6. You may garnish with fresh parsley or dill and serve hot.

KITCHEN SCIENCE COMMENTS

The proteins in the egg can get easily denatured at high temperature causing the curdling. This is not necessarily bad (as preferred in the Chinese egg-drop soup) but if one wants to avoid it then the careful equilibration of the hot broth with the cold egg-lemon mixture is a very crucial step; curdling is further enhanced by the low pH due to the citric acid of the lemon juice.

On the other hand, the citric acid helps in stabilizing the yellowish color of the liquified eggs by binding the iron present in the yolk; it also helps to more effectively emulsify the liquified egg as well as solubilize the protein. Moreover, citric acid lowers the pH which together with the high temperature it helps to eliminate any risk of salmonella which could possibly arise from the egg.

Submitted by:
Alexandros B. Oxyzolou, Ph.D. ("Dr. Oxy")
Professor of Chemistry
Los Angeles Pierce College
Chemistry Department

Summary of the Essay Writing Competition for High School Students Conducted on November 21, 2025, at Glendale High School, Glendale, CA

By Krishna Kallury

A proposal submitted by Krishna Kallury on behalf of SCALACS for an LSAC/DEIR Grant focused on how cultural foods could be harnessed to promote inclusion and belonging (erstwhile called DEIR). The proposal was approved and funded in December 2024. One activity included in the proposal was educating high school students on the benefits of recipes/food preparations from various cultures in order to generate discussion amongst themselves (and with their science teachers) on what other cultures bring to our country. For educational purposes, three seminars by eminent Dieticians and Medical Professionals from UCLA and USC were organized during 2025, and Science Teachers were requested to project these seminars in their classrooms. Recordings of the seminars were also provided so that those students who could not listen to the live seminars could do so later on.

Mr. Edward Tahmassian, Science Teacher at Glendale High School, has been a collaborator with Krishna Kallury, who is functioning as his Mentor under the Science Coaches program of ACS/AACT. His AP students and regular Grade 12 students belong to diverse communities ranging from Hispanic, Armenian, Middle Eastern and Asian. They constitute an ideal cross section to discuss foods/recipes from their heritage. They were asked to write a one-page essay on what they have learnt about their cultural foods and their nutritional and health benefits. A total of 48 students participated in the essay writing competition and twelve of the best submissions were chosen for awards of $50 gift certificates. Certificates of merit were also sent to them.

Although the remaining students did not win awards, their write-ups were very impressive and certificates of participation were sent to them.

On behalf of SCALACS, Krishna extends our sincere appreciation and thanks to Mr. Edward Tahmassian for his devotion to science and for encouraging/supervising the entire process of collecting the essays and forwarding them to him. Also, Edward distributed the award gift certificates and the certificates of merit and participation to the students.

Congratulations to these Award-Winning Students!

Emilia Galustian
Emin Tcaturian
Gayane Davtyan
Hasmik Hovakimyan
Isaiah Garcia
Lilit Manandyan
Mane Yeremyan
Massa Albuni
Nare Keshisyan
Noriah Hernandez
Wed Adnan Al-Dulaimi
Elena Gevorgyan

Left to right: Emilia Galustian, Wed Adnan Al-Dulaimi, Nare Keshishyan, Massa Albuni, Lilit Manandyan, Hasmik Hovakimyan, Yelena Gevorgyan and Emin Tcaturian

SOME OUTSTANDING ESSAYS

Many have said that the most devastating tragedy to grace history is Victor Hugo's Les Misérables–a haunting, musical blend of tainted morality and desperation. But perhaps the true 'Greatest tragedy' is the one about a theatre kid, bound to her couch by a merciless cold…on the day of Les Misérables auditions.

That was me on that couch, stuck in a whirlwind of longing and some intense FOMO as I coughed my lungs dry. Even worse, the song I had spent weeks practicing now sounded like a croak in my throat. I remember my dad coming home from work on that day a few years ago with a bag of groceries and a knowing sort of glint in his eye. He sucked his teeth at me pitifully, then pulled a few ingredients from the bag and began readying something in the kitchen. I was surprised and a little repulsed when he presented me with a bowl of thick, raw honey and shredded ginger. He explained that it was one of our many Armenian remedies, and it was guaranteed to fix my voice for the audition. There was an air of skepticism in my gaze that I'm quite sure he sensed, but I decided I wasn't in a position to be picky; I spooned the gluey honey and spicy ginger into my mouth with a tentative expression on my face. It took me more than fifteen minutes to reach the end, but I slowly became more amazed throughout that time as I realized my father had just given me a miracle. My throat felt as though it was opening up, softening, like it was coming back to me, and even more so as I topped it off with a warm cup of tea. I shot up from that spot on the couch with a newfound determination and a marvelously healed voice box–I was ready to audition.

When I remembered this day, it occurred to me that this was not the first time ginger had made an appearance in my Armenian diet. In bakeries, deft hands pound ground ginger into the dough of the savory choreg bread. An old Armenian grandma may drop a spoonful of ginger into the harissa, the chicken porridge she prepares for her grandchildren. I dislike ginger. It is bitter and sour and undelightful, and I often stray away from Armenian foods containing it. But it was after this experience– where ginger aided me–that I realized the wondrous work it may do for one's body. It single-handedly reduced the swelling of my throat, and I cannot help but think that if ginger was able to aid an inflamed throat, then it must also be able to aid inflammation within the body. Inflammation has been known to contribute to so many dreadful diseases, and it is very likely that many individuals that suffer from chronic inflammation are deficient in the anti-inflammatory aspect of their diet. But cultural cuisine has rendered itself a natural medicine–beyond just Armenians and ginger. It remains true across the world: the Japanese and miso, for instance, Indians and turmeric, Greeks and olive oil– all of which I enjoy regularly. It is for those reasons that I am no longer so quick to criticize when there's ginger ground into my dish, because I now understand what it can do for me. I have learned that it is not the connection to the medical system, but the connection to culture that ties you to your body, and the way you decide to treat and fuel your body is a reflection of whether you will sing or yearn to sing. I ended up landing the role that evening, so this "theatre kid tragedy" didn't turn out to be a tragedy for me. More for all the other aspiring Cosettes.

By **Emilia Galustian**

Different cultures have many kinds of foods, and each type of food can be healthy in its own way. When I think about the foods I have eaten from different places, I notice that many traditional meals use fresh, natural ingredients that help the body stay strong. These foods can give us vitamins, protein, and energy so we can learn, work, and feel good each day.

Mexican food I have eaten often includes beans, rice, tomatoes, corn, and vegetables. Beans give protein and fiber, which help our stomachs and keep us full longer. Corn tortillas are lighter and easier to digest than flour tortillas. Avocados give healthy fats that support the heart. Salsa made with tomatoes, onions, and peppers gives vitamin C, which helps the immune system. Many Mexican dishes also use fresh herbs like cilantro, which add flavor without unhealthy ingredients.

Asian foods, like Chinese and Japanese food, are also very healthy. Many meals include rice, fish, tofu, noodles, and vegetables like broccoli, carrots, and mushrooms. Fish has omega-3, which helps the brain and heart. Vegetables give vitamins and minerals that help the body fight sickness. Seaweed has iodine, which helps the thyroid work correctly. Asian cooking often uses boiling or light stir-frying, which keeps the food healthy.

Armenian food is another culture with healthy dishes. Armenians often use fresh vegetables, chickpeas, yogurt, herbs, and grilled meats. Foods like dolma (grape leaves stuffed with rice or meat) are healthy because they use natural ingredients and are not fried. Armenian salads with tomatoes, cucumbers, onions, and parsley give vitamins A and C. Yogurt is very common and gives probiotics that help the stomach and digestion. Lavash, a thin Armenian bread, is lighter than many other breads and easier to eat.

Russian food also has many healthy parts. Russian meals often include potatoes, beets, cabbage, fish, eggs, and soups. Borscht, a beet soup, is full of vitamins that help the heart and give energy. Cabbage has vitamin C and fiber, which help the immune system and digestion. Russian foods also use buckwheat, a whole grain that gives long-lasting energy and protein. Fish like salmon and herring provide healthy fats that help the brain and skin.

Mediterranean foods, such as Greek dishes, are known for being some of the healthiest. They include salads, olives, hummus, whole grains, and grilled meats or fish. Olive oil gives healthy fats that protect the heart. Chickpeas give fiber and protein. Many dishes use lemon, garlic, and fresh herbs, which add flavor without sugar or heavy oils. When I look at all these foods, I see that many cultures focus on balance. They use vegetables, whole grains, lean proteins, healthy fats, and natural spices. Even though the dishes are different, many of them help the body stay strong, improve digestion, and give important nutrients.

Trying foods from different cultures helps us learn about the world, respect others, and make healthier choices. It shows that good food can come from anywhere and can help us live better, stronger lives.

By **Emin Tcaturian**

In today's world, many people try to find the perfect way to eat and stay healthy. Two very important ideas help us understand this better: first, how spices can improve our health, and second, why there might be no single "perfect diet" for everyone. Both ideas teach us something important about nutrition.

First, spices are not only for flavor — they have real health benefits. According to the video "Health Benefits of Spices", many common spices—such as turmeric, cinnamon, ginger, and black pepper—contain special natural substances that help our bodies. These substances, like antioxidants and anti-inflammatory compounds, support digestion, strengthen the immune system, and even help to regulate blood sugar. Spices also let us add flavor to food without adding a lot of salt, fat, or sugar, which makes healthy food more attractive and tasty. In short, using spices is a natural way to boost wellbeing and prevent some chronic diseases, because they act like small "medicine" in our daily meals.

On the other hand, the second video "Does the Perfect Diet Exist" argues that there is no single diet that works best for absolutely everyone. What is "perfect" for one person may not be healthy or realistic for another. People have different bodies, moods, levels of activity, and biological reactions to food. In the video, experts explain that trying to follow a rigid "ideal diet" can cause stress or failure. Instead, they recommend a flexible and personalized approach. A good diet should suit your life, your taste, and your health goals.

Combining these two ideas — the power of spices and the flexibility of diet — creates a very balanced approach to health. Spices can enrich almost any type of diet: whether someone eats more vegetables, grains, meat, or plant-based foods, adding the right spices makes meals healthier and more enjoyable. And because there is no perfect diet, spices help by giving variety and flavor, so people are more likely to stick to healthy eating without feeling deprived.

In conclusion, spices and a flexible diet are both essential tools for a healthy life. Spices provide important nutrients and health benefits, while the idea of a "perfect diet" is not realistic, because each person is unique. By combining both ideas, we can build a sustainable, enjoyable, and healthy way of eating that supports our long-term wellbeing.

For me, this is the smartest and most realistic way to think about food: not looking for perfection, but using natural, powerful ingredients like spices to make good choices.

By **Hasmik Hovakymyan**

There is a saying, "We are what we eat," meaning that the quality of our life and health directly depend on our diet. More specifically, our physical and mental health, as well as our overall viability, depend on the nutrients and vitamins we receive daily. However, even though all people on the planet mostly use the same products, they season and prepare their food differently. To live a healthy and high-quality life, humans need all three groups of macronutrients: carbohydrates, lipids, and protein, as well as micronutrients, such as vitamins and minerals. Those can be found in spices and the food we eat. The ratio of macro- and micronutrients that a person receives depends on various factors, including the spices and ingredients we use in our cultural dishes.

Growing up in Armenia, Armenian food was the main cultural staple in our household. We cook and try different cultural dishes as well, but they usually get modified to taste more Armenian. We are adding spices and replacing ingredients that we are used to eating. However, despite our usual diet, we, Armenians, have specific foods for addressing various health issues. This knowledge is being passed on through generations.

A huge part of my culture is our food. Recipes being passed on by generations, we constantly make minor changes in them, making them healthier and enjoyable. Our knowledge of spices and overall food helps us design our diet and prefer what is better for us. For example, in cases of digestive problems, we typically eat matsun, which is an Armenian sour yogurt, and we drink a glass of water with a tablespoon of apple cider. Matsun is rich in probiotics and calcium, which help with digestion. Apple cider, on the other hand, is rich in probiotics and antioxidants. Another example is when we break a bone; we are recommended to eat khash, which is essentially a traditional, hearty soup made from boiled cow or sheep parts, such as hooves, head, and stomach. I remember when my cousin broke his leg, and we were having khash once a week for some time. Khash is extremely rich in collagen, which supports joint health and skin elasticity. Nowadays, it has become a popular trend to eat khash for better skin, especially among Armenian women. In the past, it was a dish designed to provide energy for a whole workday in fields through hard labor.

Regarding spices, if you open a random Armenian family's spice cabinet, you will always find ground black pepper, paprika, fenugreek, allspice, cumin, hot peppers, and garlic used as usual spices for most of the foods. For example, when we have a cold, we usually consume a lot of spicy food, especially food containing a lot of garlic and hot peppers. This is because we believe that spicy food, especially garlic and hot peppers, has antioxidant and antimicrobial properties. We even put a cup with garlic submerged in vodka in the room of people who have the flu, so the air in the room can be disinfected. And overall, we eat garlic and hot peppers not only in cases of flu, but also in general, to boost our immune system. I remember when I got diagnosed with type 1 diabetes, all of my relatives thought that they could cure it, so they kept bringing me food with a lot of fenugreek and cumin, believing that it would take my diabetes away. While they can help regulate sugar, unfortunately, that's all they can do. Also, in my household, we use black ground pepper in almost every dish. We have this strong belief that black pepper makes the food easy to digest, and we love the taste of it in dishes. Another one is caraway, which is also good for digestion.

The health benefits of spices have been studied for centuries, and some of them are more beneficial than others. We Armenians have our own ways of combining appropriate spices with matching food to maximize the health benefits, and generally, we use a lot of different spices in our cultural dishes. But, like in everything, balancing them is the key.

By **Lilit Manandyan**

Summary Report On The Proceedings of the High School Students Research Symposium Jointly Organized by SCALACS & New York Local Section Of ACS

By Krishna Kallury

Format: Virtual
Date: November 22, 2025
# of Student Participants: 24 (registered via Google Forms)
Time: Morning: 9:30 am to 12:30 pm
Afternoon: 1:00 to 4:00 pm
Presentation Duration: 15 minutes using PowerPoint slides
Guest Attendees: 10
Awards: 9 (6 by SCALACS & 3 by NYACS, $100 each)

Judges:

- Dr. Rishika Rai, Post doctoral Research Associate, UCLA Dept. of Chemistry & Biochemistry
- Ms. Yeshvi Tomar, Graduate Student, Department of Chemistry, USC
- Ms. Sydney Krata, Graduate Student USC STEM Cell and Regenerative Medicine
- Ms. Tianna Young, Graduate Student USC STEM Cell and Regenerative Medicine
- Mr. Lucky Morales, SCALACS Executive Committee Member, Younger Optics, Torrance, CA
- Mr. Edward Tahmassian, Science Faculty, Glendale High School, Glendale, CA

Participating Students & Titles of Presentations:

- Taarun Ganesh, Thomas Jefferson High School for Science & Technology, Falls Church, Virginia: *In silico Design of an epitope-based vaccine for Rocio virus using phage display & E. Coli Expression system*
- Aalif Hoque, Bethel High School, Bethel, Connecticut: *Using Computational Simulations of Antibodies to Target the Streptococcus anginosus Surface Protein TMPC to Mitigate Gastric Cancer*
- Priyal Daulat, Ashoka Global Academy, Nasik, Maharashtra, India: *OncoHope – A Portable Multicancer Diagnostic Device using Biomarker Detection*
- Alicia Medina, Phillips Exeter Academy, Exeter, New Hampshire: *Identification of a novel Short Linear Motif in Dengu Virus type 2 Envelope protein that Mediates Interaction with the Sre SH3 domain*
- David Carrion Alvarado, Bergen County Academies, Moonachie, New Jersey: *Bond Analysis of Synthesized Green Xerogel for Ocean Oil Cleanup*
- Barbara Leschinsky, Bergen County Academies, Mahwah, New Jersey: *LensGuardian to tackle dry eyes disease*
- Srilaya Mallajosyula, Wilmington High School, Wilmington, Massachusetts: *DARPin-Based Inhibition of PARP1 for Muscular Dystrophy and Overtraining Syndrome*
- Benjamin Zelikoff, George W. Hewlett High School, Hewlett, New York: *Novel Crystal Formation and Properties of Rhombohedral DNA Crystals Utilizing EDC Ligation*
- Eve Ang, Shriya Viswanathan, and Pranav Vedula, Plano Senior High School, Plano, Texas: *A 2nd Generation Multimodal and Interpretable U-Net ML Model for Enhanced Glioblastoma Multiforme Segmentation across MRI & CT Scan Modalities*
- Matt Lumbe, Jose Marti Stem Academy, Union City, New Jersey: *Antibacterial Effectiveness of a Natural Antioseptic Alternative for a Hand Sanitizer*
- Marium Khan, Masonic Medical Research Institute, New Hartford, New York: *Facile Synthesis of Monofunctional Heptamethine Cyanine Dyes by the Ring Opening of Zincke Salts*
- Ian Gu, Phillips Academy Andover, Andover, Massachusetts: *The Influence of Electrostatic Interaction on Lunar Deformation Using an N-Body Simulation Approach*
- Gary Leschinsky, Davidson Academy, Reno, Nevada: *Quantifying Soil & Climate Drivers of Plant-Available Soil Moisture in the Upper Green River Basin of Wyoming*
- Gary Leschinsky, Davidson Academy, Reno, Nevada: *Analysis of Enterococcal Diversity in Arthropod Gut Microbiomes Across Ecological Systems*
- Riya Singhal, Tomball ISD, Cypress, Texas: *Dual-Stage Discovery of Novel Xanthine Oxidase Inhibitors: Computational Modeling and In Vitro Validation*
- Amogh Vinaykumar, Flower Mound High School, Flower Mound, Texas: *Optimizing Aerogel-based Materials for Enhanced Thermal Protection in Spacecraft*
- Ayush Vasiredd, Marquette High School, Chesterfield, Missouri: *A Cost-effective Hierarchical Bimodal Nanoporous Gold Biosensor for the Electrochemical Detection of Bisphenil F through Drop Casting*
- Sonika Dhruva Konda, Del Norte High school, San Diego, California: *Adaptive Swarm Coordination for Wildfire Control via Q-Learning Tuned PSO with Quantum-Inspired Coupling*

- Grace Chenhi Li, Basic Independent Silicon Valley High School, San Jose, CA: *Evaluation of DSP and CIS Expression on Aging and Disease Through TPE-OLD*
- Seah Hong Siong Nickolas, Foothill College, Mountain View, California: *Wearable and Flexible Graphene/Titanium Tetrahydroxide Fiber Electrode with High Volumetric Capacitance and Energy Density*
- Hong Guan Isaac, Singapore International School Dual Enrollment Foothill College, Mountain View: *Single-Atom Doping of Mxene for High Performance Noble-Metal-Free Raman Scattering*
- Manasvi Sarm, Lynbrook High School, San Jose, California: *The Impacts of Wildfire Exposure on Depression Outcomes Across Socioeconomic Status in the U.S.*
- Audrey Guo, Torrey Pines High School, San Diego, California: *Modeling Expected ESR1 Gene Expression from Epigenetic and Transcriptional Features Reveals Regulatory Deviations in Breast Cancer*
- Min Shin, Lolani School, Honolulu, Hawaii: *Computational Investigation of Effects of Ligand Architecture on Homolytic Bond Cleavage and Electronic Structure of Bismuth Compounds*

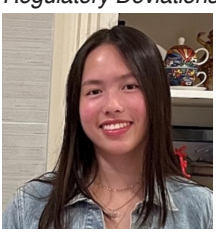
Award Winners:

Alicia Medina
Amogh Vinaykumar
Ayush Vasireddy
Audrey Guo
Benjamin Zelikoff
Gary Leschinsky
Manasvi Sharma
Shriya Viswanathan (with Eve Ang and Pranav Vedula)
Seah Hong Seong Nickolas

Abstracts of Some of the Award-Winning Presentations:

Audrey Guo

Modeling Expected ESR1 Gene Expression from Epigenetic and Transcriptional Features Reveals Regulatory Deviations in Breast Cancer



Estrogen receptor alpha (ESR1) expression determines treatment eligibility for approximately 70% of breast cancer patients. However, current immunohistochemistry (IHC) uses a binary ER+/ER– threshold that fails to capture quantitative expression heterogeneity within ER+ tumors. This variation is known to correlate with endocrine therapy response and resistance patterns. Quantitative ESR1 levels, influenced by promoter methylation and ESR1 mutations, provide a more nuanced view of estrogen-receptor regulation and treatment sensitivity.

This study introduces an interpretable multi-omics regression framework that models expected ESR1 expression from DNA methylation, transcriptional co-regulators, and clinical features, quantifying regulatory deviation as a measure of pathway integrity. Using 161 features (131 methylation probes, 12 RNA expression values, and 18 clinical variables) from The Cancer Genome Atlas (TCGA) breast cancer cohort, nine algorithms were trained in AutoGluon and evaluated on an independent test set (n = 157) using R2 and RMSE metrics, with permutation-based feature importance for interpretability. The weighted ensemble achieved R2 = 0.881 and RMSE = 0.912 (log2 scale). Transcriptional features (GATA3 16.7%, PGR 6.0%, FOXA1 5.2%) dominated prediction (29.8% cumulative importance), followed by DNA methylation (10.9%) and clinical factors (1.6%), with consistent subgroup performance (R2 = 0.826–0.971). By quantifying ESR1 expression as a continuous molecular phenotype, this framework complements binary IHC classification, resolves ambiguous ER-low cases, and provides a mechanistic bridge between methylation, transcriptional circuitry, and endocrine response. While clinical application requires prospective validation, the model establishes a quantitative foundation for studying ESR1 regulation, regulatory deviation, and heterogeneity underlying the 20–30% relapse rate among ER+ patients.

Amogh Vinaykumar

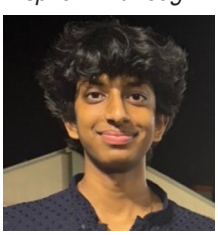
Optimizing Aerogel-based Materials for Enhanced Thermal Protection in Spacecraft

With the rapid expansion of space exploration and the pursuit of habitable environments beyond Earth, the development of advanced heat-resistant spacecraft heat shields has become increasingly critical. The selection of materials for these shields requires careful evaluation of cost, weight, density, and thermal performance. While current heat shield materials are often ablative, single-use, or prohibitively expensive, aerogels offer a promising alternative due to their exceptional insulation and low density. However, their practical application remains limited by brittleness, a weak resistance to radiation transfer, and insufficient maximum service temperature. To overcome these barriers, this study explores composite aerogel systems consisting of a hafnium–silicon carbide precursor blend, resorcinol–

formaldehyde polymeric crosslinking, and surface modification with infrared-absorbing nanoparticles such as titania. Over thirty modeling trials were carried out using Fusion and SimScale, simulating spacecraft conditions that included heat flux, convective cooling, and structural support constraints. The designed composite aerogel was compared against two benchmarks: reinforced carbon–carbon (RCC), a widely used spacecraft heat shield material, and silica aerogel, the baseline for thermal insulation. In the simulations, the composite demonstrated superior structural stability, experiencing ~25–30% less strain (~0.002 με) at peak stress compared to the baseline materials. It was also substantially less dense than RCC (0.35 g/cm3 versus ~1.7 g/cm3), representing an estimated 75% reduction in mass for the overall heat shield and a 5.3-fold weight reduction, while also reducing deformation under sustained loading. Additionally, the composite exhibited greater thermal protection, dissipating heat at the exterior surface (~5.0 × 104 W/m2) while keeping the interior relatively cool (–2.0 × 103 W/m2), efficiently radiating energy away to protect internal components. Although the composite did not achieve the extremely low thermal conductivity of silica aerogel or the high service temperature of RCC, it exhibited a thermal conductivity of 0.052 ± 0.005 W/m·K (~190-fold lower than RCC) and maintained a service temperature of 1350°C (2.1× higher than silica aerogel), with maximum temperatures exceeding 1800 °C. By addressing the longstanding drawbacks of aerogels and conventional heat shield materials, this novel material offers a promising balance of low density, structural resilience, and thermal stability. Experimental validation through cryogenic cycling, oxidative testing, and extended thermal exposure will further establish the potential of this material for reusable and multi-mission spacecraft and other demanding applications.

Ayush Vasireddy

A Cost-effective Hierarchical Bimodal Nanoporous Gold Biosensor for the Electrochemical Detection of Bisphenil F through Drop Casting



Environmental contaminants, particularly bisphenols, have become increasingly widespread. As a result, over 40% of global water bodies are severely polluted. Water pollution has a profound effect on global health, contributing to many illnesses such as cancer and skin diseases. Although it is more common, Bisphenol F (BPF) is almost unregulated. BPF is equally active as, and in certain comparisons more active than Bisphenol A and demonstrates signs of reproductive toxicity and oxidative stress induction Electrochemical sensors were examined as an affordable, portable option with surface modifications from hierarchical bimodal nanoporous gold (hb-NPG) to observe its detection ability of bisphenol F. This study was the first to fabricate a hierarchical bimodal structure of gold and observe its detection ability. SEM, Color SEM and EDS were used to analyze the structure and components of the gold. The ImageJ platform analyzed the SEM images and histograms were plotted for pore size distributions. Furthermore, cyclic voltammetry (CV) was used to observe the oxidation rates of the electrochemical sensor with dropcasting of hb-NPG. SEM and EDS confirmed hb-NPG primarily contained gold with trace amounts of silver. Furthermore, pore size analysis verified a hierarchical bimodal structure, with hb-NPG showing an increased surface area in comparison to NPG. Bare SPCE displayed enhanced BPF detection sensitivity upon surface modification, with CV showing improved oxidation rates of BPF. The findings from this study demonstrate a low-cost, scalable method for BPF detection, with future studies vital to compare the selectivity of BPF against other structurally similar compounds.

Gary Leschinsky

Quantifying Soil & Climate Drivers of Plant-Available Soil Moisture in the Upper Green River Basin of Wyoming

Enterococcus is a genus of bacteria present in the guts of arthropods that has clinical importance due to its implications for antibiotic resistance. Enterococcus has been studied in vertebrate organisms before, but little is known about its diversity across invertebrates. Exploring enterococcal diversity in natural environments is important to better understand the bacteria and their properties. In this experiment, the gut microbomes of 24 arthropod samples, representing 17 arthropod taxa, were investigated. DNA from each sample underwent an outer and a nested PCR, followed by Sanger sequencing. Sequences were compared with a curated Enterococcus database at 99% identity to determine the species of Enterococci present in different samples. After sequencing challenges, 7 samples yielded high-quality sequencing data. 5 of 7 samples (two moths, a butterfly, a wasp, and a dragonfly) contained E. faecalis, a firefly contained E. mundtii, and a centipede contained E. thailandicus. These findings highlight the vast ecological distribution of E. faecalis and also indicate the presence of rare species in certain hosts, improving our understanding of Enterococcus diversity in invertebrate gut ecosystems, which could have ecological and clinical implications.

Benjamin Zelikoff

Novel Crystal Formation and Properties of Rhombohedral DNA Crystals Utilizing EDC Ligation

Structural DNA nanotechnology uses Watson-Crick base pairing predictability to assemble precise structures at the nanoscale level. Many three-dimensional DNA crystals, such as those formed from asymmetric 2T7 tensegrity triangles, are fragile and difficult to modify after formation. This study investigates a new method for stabilizing and altering rhombohedral DNA crystals using 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) as a nonenzymatic ligation agent. EDC was hypothesized to introduce covalent linkage between a terminal phosphate and terminal hydroxyl group available from duplex strands within the crystal, augmenting the robustness of tensegrity triangles to permit internal and external modification without dissolution.

Using controlled annealing in high and low MOPS buffers and confocal microscopy, this study compared unligated and EDC-ligated crystals. EDC-ligated crystals have higher thermal stability, surviving temperatures up to 65°C, while hydrogen-bonded controls dissolved at 40°C. Following exposure to Cy5- and Cy3-dyed partially blunted tensegrity triangles, EDC-ligated crystals maintained structural integrity and exhibited both internal and side-specific fluorescence, indicating successful strand displacement and a partial "sandwich" formation. These results demonstrate that EDC-ligated crystals can undergo targeted and specific modifications after formation while maintaining the integrity of the 3D crystal lattice. Currently, there are limited studies on reprogramming an existing 3D DNA nanostructure using center strand displacement. The results from this study offer evidence to support the possibility of modifying existing crystals with this novel approach. Modification of existing crystals allows for much variability in the application of DNA crystallography for molecular sensing, drug delivery, and other medicinal nanoscale techniques.

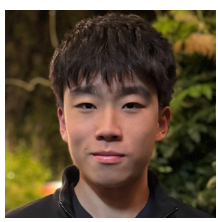
Alicia Medina

Identification of a novel Short Linear Motif in Dengu Virus type 2 Envelope protein that Mediates Interaction with the Sre SH3 domain

In order to manipulate and deregulate cellular function, viruses replicate host short linear motifs (SLiMs) to promote their own viral replication and expansion. Due to the growing evidence of viral reliance on SLiMs, understanding these interactions hold potential to uncover novel therapeutic targets and strengthen understanding of viral-host biology. Here, I investigate the potential SLiMs in (+)ssRNA enveloped dengue virus type 2 and (+)ssRNA nonenveloped virus hepatitis A with capability to associate with the SH3 domain of Proto-oncogene tyrosine-protein kinase Src. Utilizing structural and sequence analysis, I find that dengue virus type 2 contains a SLiM in its envelope protein with capability for SH3 domain binding, whereas (+)ssRNA virus hepatitis A does not. While predicting protein interactions between Src and the dengue virus type 2 envelope protein, structural integrity weakens upon removal of the SH3 domain in Src. Utilizing protein-protein docking software, I experimentally determined crystal structures of the dengue virus 2 envelope protein and Src SH3 domain to predict energetically favorable molecular interactions. To identify potential downstream consequences of dengue virus competition for the Src SH3 domain, I investigated a large-scale database of both known and predicted protein interaction networks, determining cellular functions that may be derailed by dengue virus serotype two hijacking of Src SH3 hijacking. In all, my research highlights a strong capability for Src SH3 domain binding by a SLiM present in the Dengue virus.

Nickolas Hong Siong Seah

Wearable and Flexible Graphene/Titanium Tetrahydroxide Fiber Electrode with High Volumetric Capacitance and Energy Density



This research presents a novel graphene/Ti(OH)4 (Gr/Ti(OH)4) fiber electrode developed for high-performance fiber-shaped supercapacitors (FSCs). The electrode was fabricated through an in-situ chemical hydrolysis process, followed by self-assembly, wet-spinning, and reduction. The incorporation of Ti(OH)4 nanoparticles mitigates the re-stacking of graphene flakes and enhances faradaic activity, leading to superior mechanical and electrochemical properties. The resulting fiber exhibits an exceptional tensile strength of 483.60 MPa and an elongation at break of 2.07%. When assembled into a symmetric supercapacitor, the device achieves a high volumetric capacitance of 188.04 F cm–3 and an outstanding energy density of 15.39 mWh cm–3. Furthermore, it demonstrates remarkable cycling stability with 98.6% capacitance retention over 5,000 cycles and excellent mechanical durability, retaining 98% of its capacitance after 1,000 bending cycles. These attributes make it ideally suited for direct integration into next-generation wearable and portable electronics. Potential applications include powering smart textiles and e-textiles for health monitoring, enabling flexible energy storage in roll-up displays and foldable devices, and serving as a durable power source for advanced military and sports gear. This work thus provides a promising path for designing durable, high-energy-density power sources that are essential for the future of flexible electronics.

Shriya Viswanathan

A 2nd Generation Multimodal and Interpretable U-Net ML Model for Enhanced Glioblastoma Multiforme Segmentation across MRI & CT Scan Modalities

With glioblastoma multiforme being one of the most aggressive and common adult malignant brain tumors where 250,000 cases are diagnosed each year globally, early intervention is crucial to improving the low median overall survival rate of 15 months. However, manual anatomical segmentation is prone to inter-observer variation while existing artificial intelligence models sacrifice either interpretability, computational efficiency or multimodality. This lack of holistic design poses a major barrier to the clinical viability of deep learning models and Neuroflux was developed to achieve an equilibrium across these three domains. Neuroflux v1 first enhanced the preprocessing of raw data, applied our custom hybrid loss strategy, implemented significant improvements in regularization techniques and fine-tuned to incorporate targeted modifications and optimized dropout rates. This streamlined approach demonstrated reduced inference time and computational load, showcasing Neuroflux v1's early potential for sustainable deployment in low-resource clinical settings. While magnetic resonance imaging-based segmentation models have advanced considerably, their clinical translation remains constrained by reliance on asingle imaging modality, high computational requirements and limited clinical transparency. To further address these challenges, the previously validated Neuroflux v1 framework was extended to incorporate computed tomography imaging as it is a more widely available modality in clinical workflows. Neuroflux v2 continued to employ a lightweight 2D U-Net backbone augmented with Gradient-weighted Class Activation Mapping for saliency-based interpretability in magnetic resonance imaging and utilized a custom convolutional neural network classifier for computed tomography imaging, the latter of which achieved a classification accuracy of 0.9769 on held-out test data. This validates the possibility of robust generalization across modalities while maintaining computational efficiency, potentially enabling deployment across diverse clinical infrastructure settings. Neuroflux v2's optimized U-Net framework, multimodal input integration and Gradient-weighted Class Activation Mapping interpretability underscore its value as a sustainable, transparent and clinically adaptable tool for global neuro-oncology practice.

Manasvi Sharma

The Impacts of Wildfire Exposure on Depression Outcomes Across Socioeconomic Status in the U.S.

Wildfires are a constantly growing environmental hazard, along with evidence linking them to various physical and psychological health outcomes. Depression is one of the most common mental health disorders in the U.S., yet few studies have examined how socioeconomic status influences wildfire-related mental health outcomes. This study investigated the association between wildfire exposure and adult depression prevalence across the U.S., with socioeconomic status (poverty rate) as a moderating factor. County-level data from the Behavioral Risk Factor Surveillance System, American Community Survey, and U.S. Forest Service LANDFIRE projects (2019–2021) were merged using Federal Information. Processing Standards codes. Wildfire exposure was measured using the mean fire return interval (MFRI), and statistical analysis was conducted by using Ordinary Least Squares (OLS) regression with clustered standard errors and interaction terms. The results revealed that both wildfire exposure and poverty were significantly associated with higher depression prevalence, with socioeconomic conditions moderating their relationship. Overall, these findings highlighted how environment and socioeconomic status interact to shape mental health outcomes. Further research is needed to clarify causal pathways and guide region-specific interventions addressing both climate resilience and mental health equity.

Remarks received:

Yeshvi Tomar, Graduate Student, Department of Chemistry, USC (Judge)

Thank you for inviting me to this wonderful opportunity to judge the high school research presentations. I thoroughly enjoyed the experience. It was very uplifting to hear the students speak about their work, and it wasn't easy to assign scores, as all the students showed meaningful promise in their work.

Ping Furlan, New York Local Section and Co-Coordinator of the symposium

Thank you so much for inviting the NYACS to co-sponsor this meaningful event, and for your tremendous effort in creating such a wonderful platform for high school students to share their research. It's impressive to see how this program has successfully attracted students from across the country and around the world, all presenting high-quality work with a clear understanding of the purpose and impact of their projects.

Collaborate, Innovate, and Transform at ACS Spring 2026

Join the global chemistry community at one of the year's biggest events in science at **ACS Spring 2026 in Atlanta, Georgia** from **March 22 through 26.**

Choose from thousands of oral presentations covering every area of specialty in chemistry and dive into cutting-edge research at the poster sessions. Witness emerging leaders and their groundbreaking contributions to science during the Open Board Session and Priestley Medalist Address, and the Kavli Lectures.

Explore the ACS Exposition Hall to connect with industry leaders as they showcase the latest innovations, technology, and scientific products. Engage in industry-focused talks from scientific leaders covering trending topics during special sessions happening in the ChemSpark and Periodic Talks Theaters in the ACS Exposition Hall. Experience a rich lineup of career development sessions and workshops, one-on-one Career Consulting, and more when you visit the ACS Career Fair.

Celebrate 150 years of progress in chemistry and attend special events to mark ACS' 150th anniversary. Discover curated chemistry communities that offer tailored programming, allowing you to delve into your interests with like-minded scientists who share fresh perspectives and insights on the latest research and trends in science.

ACS Spring 2026 is your gateway to share your science, advance your career, and transform your network. Learn more and register at:
https://www.acs.org/events/spring.html

Housing for ACS Spring 2026 is NOW OPEN! Secure your room under the ACS housing block for your favorite hotel before all the rooms are gone: https://brnw.ch/21wXt4N

Thirty-five chemists met at the College of Pharmacy of the City of New York on April 6, 1876, to found the American Chemical Society. **April 6, 2026,** will mark **ACS' 150th Anniversary**. The community will celebrate the milestone globally throughout 2026—a historic milestone built on discovery, innovation, and community.

Join us as we celebrate the legacy of chemistry and look ahead to the next chapter of scientific progress. The theme of the celebration is **"Chemistry is Everything." Chemistry is the solution: It connects us. It transforms us. It is everything.**

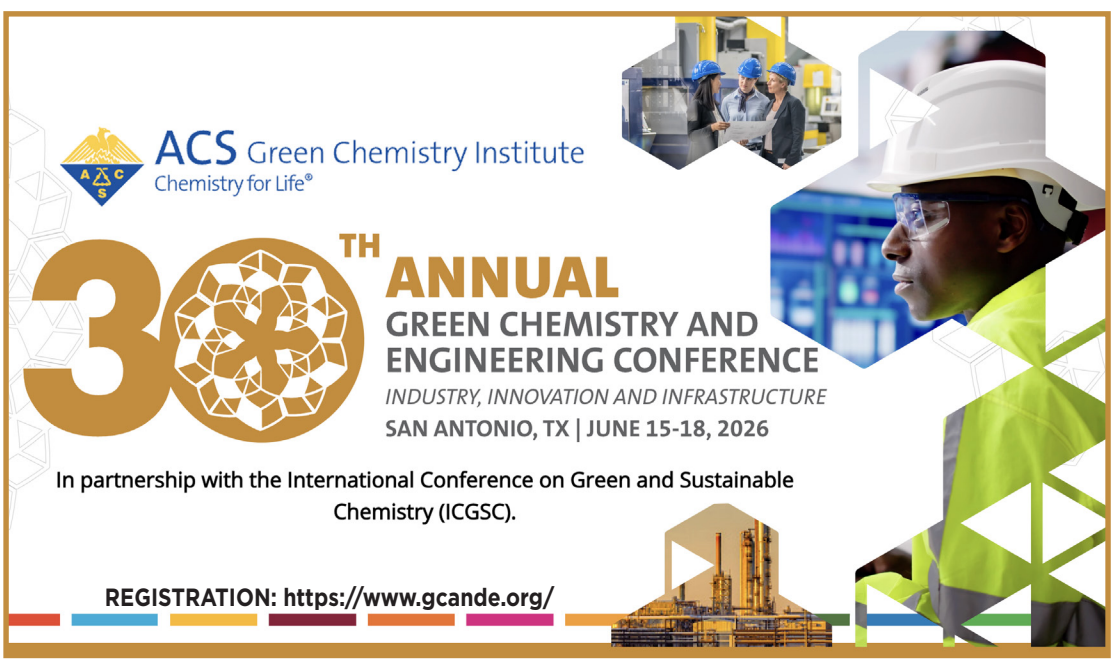
We will celebrate 150 years of chemistry's transformative power and the people who made it possible—including you. Together, we will catalyze the next 150 years of chemistry.

ACS Anniversary Week is on April 6–10, 2026: Recognize the past, present and future of chemistry during this week.

Bookmark this website: **https://www.acs.org/150.html.**

To get involved, email **ACS150thAnniversary@acs.org.**

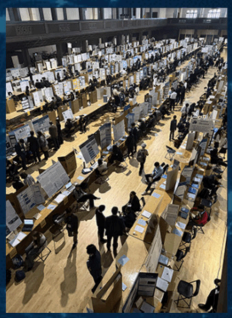
Follow **#ACS150** on social media.



76th LOS ANGELES COUNTY SCIENCE & ENGINEERING FAIR 2026

March 8-9, 2026
Shrine Expo Hall, Los Angeles

LEARN MORE: https://www.lascifair.org/



The Regeneron ISEF event week will be held from May 9-15, 2026 at the Phoenix Convention Center.

Regeneron ISEF is an international pre-college STEM competition hosted in Dallas, Texas. It runs from May 13 to 19 at the Kay Bailey Hutchinson Convention Center. Students in grades 9-12 must first compete in regional competitions that are Regeneron ISEF-affiliated and advance before coming to ISEF. (See more info here: https://www.societyforscience.org/isef/affiliated-fair-network/)

Every conceivable discipline of science, technology, engineering, and mathematics is covered, allowing students to choose a subject that interests them most. The affiliated science fairs are available in nearly every state and around 70 countries in the world.

There are cash prizes in excess of $6 million awarded yearly and real-world experience that translates nicely into college and careers.

More info: https://www.societyforscience.org/isef/

Adventures in Analytical Chemistry: True Stories of a Chemistry Detective

by Barbara Belmont

For nearly 40 years, I worked as an analytical chemist for a small independent laboratory that specialized in chemical problem solving. That is, I was a chemistry detective retained to find out the cause of product failure, the identity of anomalous substances, or the solution to a confounding chemical problem. To pay the bills, however, I applied my detective skills to delivering exemplary VOC compliance testing of coatings and consumer products.

A little background: Our local geography and weather conditions trap aerosolized particulate pollution and also create photochemical smog. To address the issue, the South Coast Air Quality Management District (SCAQMD) was created. SCAQMD regulates the amount and composition of volatile organic compounds (VOC) that are allowed to be in all sorts of coatings and adhesives, including architectural coatings. By limiting the amount of VOC in these products, SCAQMD has significantly helped reduce photochemical air pollution in the area.

VOC can be determined indirectly or directly. The indirect method is simple and cheap. It involves testing for total volatile matter through a simple evaporation test, testing for total water by Karl Fischer titration, then finding the difference between the two to calculate VOC. That is, whatever is volatile that is not water is considered to be VOC. The direct method uses GC-MS. And while it is a more specific method, it is more difficult to use because it requires discovery of the identity of all organic volatile matter before it can be assayed. Since every product is different, extensive quality assurance testing is required to prove that a direct assay is actually working properly.

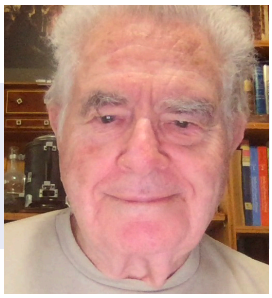
All that background is needed to explain one of my more memorable VOC testing adventures. A paint product came to me labeled “zero VOC”. Using the indirect method, I found 2.5% VOC. The client insisted their VOC content was “zero”, and engaged me to figure out why it wasn’t “zero”. During the composition discovery part of the analysis, I found some N-butyl diethanolamine, tetramethyl decynediol, and tetrathylene glycol with a total roughly estimated concentration near 2.5%. In talking with the client about my discovered volatile substances, they said “but those aren’t VOCs… are they?”. “Well”, I responded, “they are organic, they evaporate under the test conditions, and they are not exempt, so they must be VOCs.” They had made an incorrect assumption about the volatility of those ingredients in their paint. After some thought, the client decided it would be better to re-label the product to “ultra low VOC”, than to reformulate. I was very relieved to terminate the project, because I was in no way prepared to rigorously quantify those compounds!

Barbara Belmont has a Professional Science Master’s in Analytical Chemistry from Illinois Institute of Technology, is an ACS Fellow, and serves the local ACS section as Secretary/ Treasurer. Barbara closed the lab in 2021 so she could finish out her productive years enjoying her first career goal of teaching college chemistry. She is a full-time Lecturer at CSU Dominguez Hills, teaching Quantitative Analysis, a type of Analytical Chemistry.

THIS MONTH IN CHEMICAL HISTORY

BY

HAROLD GOLDWHITE
California State University, Los Angeles
hgoldwh@calstatela.edu



Arthur Young (1741 – 1820) was an English agriculturalist, famous in his time for his experiments and publications on how to best work the land. His books included “A Course of Experimental Agriculture” and “Annals of Agriculture”, a journal of which 45 volumes were published. His agricultural interests led him to travel extensively not just in Britain and Ireland but also in continental Europe, and he published several volumes of his travel diaries.

“But wait a moment” I hear you say. “What has this to do with the history of chemistry – which is why I read your column.” Patience – and all will be revealed. I am looking at my copy of Young’s “Travels in France and Italy during the years 1787, 1788, and 1789” which was published in 1792. I have the Everyman Edition that does not contain a publication date; I am guessing early in the 20th Century. As a student of agricultural science Young made it his business to include visits to scientists in his travels, including chemists. A glance at the index of this travel book reveals the names Fourcroy; de Morveau; and Lavoisier—all young chemists at the heart of the chemical revolution, and all to a lesser or greater effect involved in the French Revolution that began in 1792. Young adds a short chapter on that event as an appendix to this book. The rest of this column was very easy to compose. I include quotations from Young about his visit to the Lavoisiers.

“To the arsenal to wait on Monsieur Lavoisier, the celebrated chemist, whose theory of the non-existence of phlogiston has made as much noise in the chemical world as that of Stahl, which established its existence. Dr. Priestley had given me a letter of introduction. I mentioned in the course of conversation his laboratory, and he appointed Tuesday.”

“To Monsieur Lavoisier, by appointment. Madame Lavoisier, a lively, sensible, scientific lady had prepared as “dejeuné Anglois” of tea and coffee, but her conversation on Mr. Kirwan’s “Essay on Phlogiston”, which she is translating from the English, and on other subjects, which a woman of understanding that works with her husband in his laboratory knows how to adorn, was the best repast. That apartment, the operations of which have been rendered so interesting to the philosophical world, I had pleasure in viewing. In the apparatus for aerial experiments nothing makes so great a figure as the machine for burning inflammable and vital air to make or deposit water; it is a splendid machine. Three vessels are held in suspension with indexes for marking the immediate variations of their weights; two that are as large as half-hogsheads contain the one inflammable, the other the vital air, and a tube of communication passes to the third, where the two airs unite and burn; by contrivances too complex to describe without plates, the loss of weight of the two airs, as indicated by their respective balances, equal at every moment to the gain in the third vessel from the formation or deposition of the water, it not being yet ascertained whether the water be actually made or deposited. If accurate (of which I must confess I have little conception), it is a noble machine. Monsieur Lavoisier, when the structure of it was commended, said [I translate his remark] “Yes, sir, and even made by a French artisan” with an accent of voice that admitted their general inferiority to ours…… His pond of quicksilver is considerable containing 250 lb.”

Later in his travels Young visits Parma and its Institute of Electrical Studies “which has acquired a greater reputation than it merits…. A well-arranged laboratory, clean, and everything in order, in a holiday dress, is detestable; but I found a combination of many pleasures in the disorderly dirty laboratories of Messrs. De Morveau and Lavoisier." (Don’t share this with students!) Incidentally you can view a good deal of Lavoisier’s laboratory equipment at the Musée des Arts et Metiers in Paris. It was confiscated by the State after Lavoisier’s execution, but returned to his widow much later.

I wish you Happy Holidays and a successful New Year.

2026 UPCOMING EVENTS

March 8 - 9	76th Annual Los Angeles Science & Engineering Fair
March 12 -13	High School Chemistry Olympiad Local Exam
March 22 - 26	ACS Spring Meeting 2026
April 6 - 10	ACS 150th Anniversary Week
April 10 - 19	High School Chemistry Olympiad National Exam
April 19 - 25	Chemists Celebrate Earth Week (Theme: Into the Woods with Chemistry)
May 9 - 15	Regeneron ISEF Event
May 31 - June 13	High School Chemistry Olympiad Study Camp
June 15 - 18	30th Annual Green Chemistry & Engineering Conference
July 10 - 19	International High School Chemistry Olympiad
August 23 - 27	ACS Fall Meeting 2026
October 18 - 24	National Chemistry Week

Actual event dates and titles to be announced. Events are subject to change. For most up-to-date information, visit www.scalacs.org.

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