

# SILICON VALLEY CHEMIST



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## Chair's Message

Natalie McClure



As societies worldwide emerge from the isolation imposed by the Covid pandemic, we all have an opportunity to adapt and evolve some of our pre-pandemic practices. Last month, SVACS

celebrated the **2022 Mosher Award** with an in-person gathering at Stanford University's Sapp Science Center. It was a fun evening, with Professor Zare presenting stories and challenges that he

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### Abstract

Chemical informatics technology is improving access to the text and images of patents and the scientific literature through computer-curation. In the example of a collaboration between a team of computer scientists at Google Patents and chemical informaticians at Ontochem, annotated data is produced from the patents of ~138

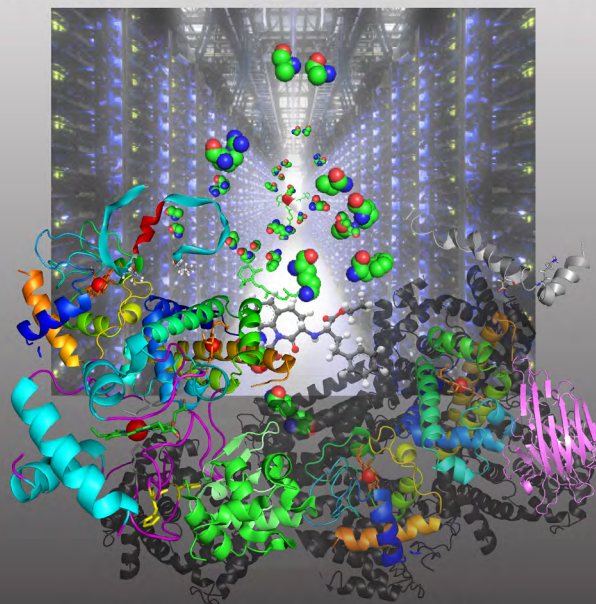
countries translated from ~ 58 languages as well as from Google Scholar and Books. The annotators identify entities such as chemical names, diseases, proteins, and genes that are then post-processed into machine-readable formats, normalized, and labeled with unique ontology concept identifiers (OCIDs). Chemical names and images

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ACS  Silicon Valley & Puget Sound

Stephen Boyer PhD  
Collabra, Inc.

Curating Worldwide Scientific Content



Wednesday, 12 April 2023 | 7:00pm PDT

For more information and to register for this seminar, go to <https://www.siliconvalleyacs.org/event/curating-worldwide-scientific-content/>. Registration is free and required to receive a Zoom link.

*Download and share the flyer*

## Curating Worldwide Scientific Content

Stephen K. Boyer, PhD., Collabra, Inc.

Sponsored by the **Silicon Valley** and the **Puget Sound** Sections of ACS  
7:00-8:00pm, Online via Zoom, Free, **Registration required**

are postprocessed using name-to-structure and image-to-structure programs, producing associated metadata, e.g., SMILES strings, InChIs, and InChIkeys. In this manner worldwide patents and the scientific literature are rendered searchable by structure-substructure searching. This is demonstrated on the freely available Google Patents platform. Data derived from patents are downloadable in machine-readable formats (SMILES), while data derived from the scientific literature is available via new commercial offerings such as Dimensions from Digital Science.

The output of non-copyrighted data of >54 billion scientific and related entities is donated to NIH and made available in PubChem and in Google Big Query. These collaborative efforts provide researchers access to previously unavailable resources, relevant in the areas of pharmaceuticals, publishing, health care, and environmental science. Integration of this data with massive amounts of additional scientific information contained in the Big Query environment provides a rich resource for machine-learning and widespread value for the worldwide scientific community.

**Bio: Stephen K Boyer, PhD**, Collabra Inc  
<https://www.linkedin.com/in/stephen-k-boyer-15529>



Steve Boyer works in the interdisciplinary space of chemistry and computer science. By automating the curation of patents and the scientific literature, his goal is to expand the scientific community's understanding and use of published information in chemistry, the physical sciences, medicine and intellectual property.

His professional history combines ten years of synthesis and scale-up in the pharmaceutical industry (Ciba-Geigy/Novartis) with 25 years in technical capacities at IBM Research. He has participated in several start-ups and currently serves as a science advisor at Google, Digital-Science, OntoChem and several other cheminformatics enterprises. He played a major role in making patent information publicly available in the early days of the internet.

Steve holds a BA from Temple University in Philadelphia and a PhD in synthetic organic chemistry from Tufts University. His publications and patents range from new drug syntheses to text+image analytics. <https://bit.ly/3Ky5XSU>

faced over the years as a member of the Stanford Chemistry department, including several years as Chair. It was marvelous to see everyone again in-person and to share that friendly networking environment. But we can also acknowledge that the years of holding meetings by Zoom had some benefits. It is easy to attend an evening seminar from the comfort of one's own home and avoid the hassle of Bay Area traffic. The Zoom meetings also allow remote participation. In fact, we have had international attendance at some of our SVACS Zoom seminars. So, to enjoy the benefits from both approaches, we will be adopting a mixed schedule. We hope to hold an in-person gathering once a quarter, with Zoom seminars added to the schedule as well.

Our **next seminar** (described elsewhere in this newsletter) will be a joint meeting with the Puget Sound ACS local section, held over Zoom. On April 12, Dr. Steve Boyer will present an update on "Curating Worldwide Scientific Content" which will describe ongoing efforts to provide researchers readily searchable access to previously

unavailable resources, relevant in the areas of patents, pharmaceuticals, publishing, health care, and environmental science.

Later this year, we will host Dr. P. Andrew Evans, Alfred R. Bader Chair in Organic Chemistry at Queen's College, Ontario for an encore presentation of his research. Dr. Evans was the 2020 **Mosher Award** recipient, and did not have the opportunity to present his work in-person. He will return to the Bay Area for a second presentation, this time in-person. Stay tuned to this newsletter for the details.

As my last comment for this chair's message, the **Spring 2023 ACS National Meeting** will take place later this month in Indianapolis. ACS National is also adapting to the new post-pandemic environment – the format of the National Meeting will include both virtual presentations and familiar in-person events such as the Sci-Mix poster session and the ever-popular Exposition. I hope you can participate either virtually or in-person. I'll be there in-person and look forward to connecting with friends and colleagues.

### Call for Nominations

## Shirley B. Radding Award

Deadline: May 1, 2023

The **Radding Award** was established in 1994 by our ACS local section to recognize demonstrated, dedicated, unselfish leadership, service and significant contributions, over a sustained period of time, to industrial, academic, or applied chemistry and to the American Chemical Society at local, regional and national levels. The award is named for Shirley B. Radding, who was a charter member and long-time supporter of this Section. It currently consists of an engraved plaque and a check for \$1000.

Award recipients selected on the following criteria:

- Member of the American Chemical Society for more than 20 years
- Demonstrated dedicated and unselfish service to ACS members over a sustained period of time
- Provided leadership through elected and appointed ACS positions at local, regional, and national levels
- Made significant contributions to industrial, academic, or applied chemistry

Please submit nomination dossier with CV and two letters of recommendation by May 1, 2023 to:

Heddie Nichols, Chair, Radding Award Committee  
 Silicon Valley Section, American Chemical Society  
 P.O. Box 395, Palo Alto, CA 94302-0395  
 or email: [hnichols105@gmail.com](mailto:hnichols105@gmail.com)

#### Past recipients:

1994 Shirley B. Radding	1995 Agnes Ann Green	1996 John C. "Jack" Riley
1997 Howard M. Peters	1998 Alan C. Nixon	1999 Valerie J. Kuck
2000 Halley A. Merrell	2001 Norman A. LeBel	2002 Paul H. L. Walter
2003 Jean'ne M. Shreeve	2004 Maureen Chan	2005 Glenn Fuller
2006 Janan Hayes	2007 Merle Eiss	2008 Dorothy Phillips
2009 Bryan Balazs	2010 Herb Silber	2011 Carol A. Duane
2012 Bonnie A. Charpentier	2013 Mamie W. Moy	2014 Lee H. Latimer
2015 Connie Murphy	2016 Sally Peters	2017 Gary D. Christian
2018 Peter Rusch	2019 Mary Virginia Orna	2020 Thomas R. Beattie
2021 Natalie McClure	2022 Marinda Li Wu	

# CALENDAR OF EVENTS <https://www.siliconvalleyacs.org/events/>

## - March 2023 -

**Mar 5 Empowering Academic Researchers to Strengthen Safety Culture Workshop**

Sponsored by ACS Division of Chemical Health & Safety  
11:00am-2:30pm, Online via Zoom, \$25, [Registration required](#)

**Mar 6 Our SciFi Future**

Sponsored by the Stanford Graduate School of Business' Leadership for Society Program

6:30-7:15pm, Online via YouTube, Free, [Registration required](#)

**Mar 8 Perspectives on AI/ML in Chemistry from Academia and Industry**

Sponsored by Science of Synthesis/Thieme Publishers  
6:00-8:00am, Online via Zoom, Free, [Registration required](#)

**Mar 8 Women in Data Science (WiDS) Conference**

Sponsored by Stanford's Institute for Computational and Mathematical Engineering, Stanford Data Science  
8:30am-6:00pm, Stanford Alumni Center and Online, \$200-400, [Registration required](#) | [Learn more](#)

**Mar 8 International Women's Day**  
[Learn more](#)

**Mar 9 Nature's Lipid Nanoparticles: Exosomes in Drug Delivery and Therapeutics**

Sponsored by ACS Webinars and CAS  
11am-Noon, Online via Zoom, Free, [Registration required](#)

**Mar 11 Kid Makers: Pop Up Chemistry**

Sponsored by Redwood City Public Library and ACS Silicon Valley Section  
2-3pm, Redwood City Public Library, Free, [Learn more](#)

**Mar 13 Me, Myself, and Technology: How Tech Defines Us**

Sponsored by the Stanford Graduate School of Business' Leadership for Society Program  
6:30-7:15pm, Online via YouTube, Free, [Registration required](#)

**Mar 15 Successful Transitions: Strategies for Adapting to a New Role**

Sponsored by ACS Webinars and ACS Younger Chemists Committee  
11am-Noon, Online via Zoom, Free, [Registration required](#)

**Mar 16 Bay Area Psychedelic Science Symposium**

Sponsored by Stanford University Wu Tsai Neurosciences Institute  
9am-5pm, Stanford Neurosciences Building E241, Free, [Registration closed, join waitlist](#) | [Learn more](#)

**Mar 16 Toxicology 101: Chemicals and their Toxic Effects**

Sponsored by ACS Webinars and ACS Office of Career and Professional Education  
11am-Noon, Online via Zoom, Free, [Registration required](#)

**Mar 18 Positive Intelligence to Boost Your Leadership** (Winter Workshop 2023)

Danielle McCombs, Life/Career Coach & Podcast Host  
Sponsored by Association of Women in Science-Northern California Chapter  
9am-1:30pm, Lawrence Hall of Science, 1 Centennial Drive, Berkeley, CA  
Cost: General \$40, AWIS "Member" \$30, Student \$15, [Registration required](#) | [View flyer](#)

**Mar 23 How Artificial Intelligence is Changing Drug Discovery**

Sponsored by ACS Webinars and the Science History Institute (SHI)  
10am-11am, Online via Zoom, Free, [Registration required](#)

**Mar 26-30 ACS Spring National Meeting 2023, In-Person & Virtual**

Indianapolis, IN. [Learn more and register](#)

## - April 2023 and Beyond -

**Apr 12 Curating Worldwide Scientific Content**

Stephen Boyer, PhD., Collabra, Inc.  
Sponsored by the Silicon Valley and Puget Sound Sections of ACS  
7:00-8:00pm, Online via Zoom, Free, [Registration required](#)

**Apr 13 RAMP in the Research Lab Workshop**

Sponsored by ACS Division of Chemical Health & Safety  
Noon-3:00pm, Online via Zoom, \$25, [Registration required](#)

**Apr 16-22 Chemists Celebrate Earth Week**

Theme: The Curious Chemistry of Amazing Algae  
[Learn more](#)

**Apr 20 SSRL 50th Anniversary Celebration**

Sponsored by Stanford Synchrotron Radiation Lightsource (SSRL)  
8am-5pm, SLAC National Accelerator Laboratory, 2575 Sand Hill Road  
Menlo Park, CA 94025, Free, [Registration required](#)

**Apr 28 21st Annual Bunnett Symposium, UC Santa Cruz Department of Chemistry and Biochemistry**

Featured lecturer Dr. John Warner, co-founder of the field of Green Chemistry  
4pm. [Learn more](#)

**Jul 28-30 Postdoc to Faculty Workshop**

Sponsored by ACS  
Held in Chicago, Illinois ([Learn more and register](#))



## Mosher Award and Lecture



Dick Zare receives the Mosher Award plaque from Natalie McClure, Chair of Silicon Valley ACS.



Dick's last story was about the Chemistry of Cooking class that he teaches to undergraduates.

Members of the Silicon Valley ACS Section and faculty, students, and staff from Stanford University *gathered on February 24, 2023* to celebrate *Richard (Dick) Zare* receiving the well-deserved the 2022 *Harry and Carol Mosher Award*, the Section's highest award. The evening began with a networking reception with hors d'oeuvres and wine and was followed by Professor Zare's acceptance talk. He entertained with stories that provided an insider's view about the history of the Stanford Chemistry Department, why he came to Stanford, and what it was like being the Chair of the Chemistry Department. He colorfully illustrated the atmosphere of competition and collaboration that apparently exists in many academic departments by showing the music video by Salut Salon "Competitive Foursome" ([Watch on YouTube](#)).

The evening was capped off with Silicon Valley ACS Chair Natalie McClure presenting Professor Zare with the Mosher Award plaque.



Ruben Luo's family gave Dick a bouquet of flowers that he shared with his wife, Susan, just before he also gave her the honorarium. Several members of the Zare family attended the event too.

If you are interested in learning more about the history of Stanford's Chemistry Department, see:

- [Overview](#) and [Stanford Chemistry Milestones](#)
- [Stanford Chemistry Faculty](#), [Emeriti Faculty](#), and [In Memoriam](#) (Faculty)
- Hutchinson, Eric. 1977. *The Department of Chemistry, Stanford University, 1891-1976: a brief account of the first eighty-five years*. Stanford, California: Department of Chemistry, Stanford University.
- Mosher, Harry S. 2006. *Stanford Chemistry Department, 1977-2000*. (Edited by W.E. Moerner)



Salut Salon "Wettstreit zu viert" | "Competitive Foursome" online video ([Watch on YouTube](#))



*The Chemistry Building* as it was built in 1902. It was renovated and reopened as the Sapp Center for Science Teaching and Learning in 2016.

# Editorial: C&EN Returns to the ACS Publications Division

By **Michael McCoy**

C&EN executive editor for business and policy, C&EN interim editor-in-chief

*Reprinted article from C&EN, published February 26, 2023*

“Magazines like C&EN that are published by professional societies are unique and awkward beasts. They were created to provide members of the society with news about their profession and the society itself. Today, thanks to the internet, their reach can extend well beyond those members to interested readers worldwide.

But such magazines don't fit neatly within the societies that own them. Although many members consider a magazine the main benefit of their membership, publishing trustworthy, independent journalism is not in a professional society's skill set. Covering fields where the society has a financial interest can be fraught. Adding to the awkwardness, many society magazines have become financial burdens on their parent organizations in recent years as traditional forms of advertising have dwindled.

C&EN has long felt these tensions, including the financial one. In 2021, the American Chemical Society *transferred the magazine* from its revenue-generating Publications Division to a newly formed Communications Division, a part of the organization that is also in charge of disseminating press releases and other information about ACS. One of the reasons ACS gave for the move was to put C&EN on firmer financial footing.

The intention may have been good, but ACS leaders didn't anticipate the outcry from C&EN's journalists, who rightly equated the Communications Division with public relations and saw the move as potentially compromising *C&EN's editorial independence*—if not in fact, then certainly in perception.

Several experienced editors and reporters left C&EN after the change of division. Then in December 2022, ACS dismissed the magazine's editor in chief and one of its executive editors in a *reorganization aimed at enhancing C&EN's coverage of ACS*. Many *ACS members were dismayed by the dismissals and new mandate*, and online *letters* and *a petition* circulated urging ACS leaders to keep the magazine's focus on important stories that affect the chemistry enterprise. Another round of staffers quit, leaving the ranks severely depleted.

The turmoil at C&EN was a crisis for Al

Horvath, who was *named CEO of ACS* in November and started the job Jan. 1. In a Feb. 8 town hall meeting with C&EN staffers, he said he had spent 90% of his time in recent weeks grappling with the future of the magazine.

Two days later, Horvath announced that C&EN would return to the Publications Division. In a follow-up meeting, Jim Milne, the head of the division, welcomed the magazine back. A slate of interim editors was named to replace some of those who had left. One of them is me, C&EN's executive editor for business and policy, who will be editor in chief until a permanent top editor can be found. The other interim editors (not yet reflected on our masthead) are Laura Howes, team lead for life sciences coverage; Mitch Jacoby, team lead for physical sciences;

and Chris Gorski, science news editor.

The past 3 months have been difficult for C&EN's staff, including those of us who have chosen to remain. We've had too many departure announcements and teary farewell calls on Zoom. Meanwhile, some issues of the magazine are a little thinner, and we are deviating modestly from our weekly publishing schedule. Some days our website has fewer new stories than usual, and we aren't as able to do multimedia and special projects.

But I can say with certainty that we remain dedicated to our mission of providing credible, authoritative journalism that chemical scientists need. We continue to be guided by a thorough and thoughtful *Standards and Practices* document that codifies our independence and explains how we conduct our reporting. And I am confident that we will rebuild our staff while staying true to our values of informing chemical scientists and making journalism that matters.”



## University of California, Santa Cruz Chemistry & Biochemistry Department's Annual Bunnett Symposium

April 28, 2023, 4:00pm

John C. Warner

Together with Paul Anastas, John has defined the field of Green Chemistry and created the 12 Principles of Green Chemistry. He has spent his life working to change the field of chemistry and the education of future chemists to ensure that all practicing chemists will one day have the necessary skills to invent truly sustainable technologies. He has co-founded the non-profit “Beyond Benign,” which provides educators with the tools, training and support to make green chemistry an integral part of chemistry education, and asks University chemistry programs to incorporate the principles of green chemistry into their required curriculums.

For more information, please go to our website, [www.science.ucsc.edu/bunnett-symposium-2023/](http://www.science.ucsc.edu/bunnett-symposium-2023/).



## Welcome to the Silicon Valley Section of ACS

Each month, the section receives a spreadsheet from national ACS with the names of members new to our section. The members are either new to ACS, have transferred in from other areas, or are the newest members -- students. To welcome new members to the section, the Executive Committee offers new members a free dinner at a SVACS seminar meeting. Come join us at our in-person dinner meetings! To register as our guest for an in-person dinner event, contact us directly to receive complimentary admission for you and a friend.

We hope you will also join us for an outreach event, like judging a science fair, proctoring the high school Chemistry Olympiad, or participating in a National Chemistry Week hands-on experiment event. The local section is a volunteer organization. Attend an event, volunteer to help, and get to know your local fellow chemists. Welcome!

### NEW ACS MEMBERS

Benjamin Bruxvoort  
Eugene L. Piatnitski Chекler  
Matthias Michael Fallon  
Shiraz Harel  
Kunlun Hong  
Thomas F. Jaramillo  
Zhe Ji  
Prasanna Kandel  
Mark J. Lowman

Romain Morodo  
Nikol Obradovic  
Abigail Ramirez  
Paul Riehl  
Max Saccone  
Annina Sartor  
Patrick Skelly  
Jennifer Thomas

Carlos Torres Garcia  
Karen Tuttle  
Srimukh Prasad  
Gang Wan  
Laura Wu  
Yufei Wu  
Chengshuang Zhou  
Qi Zhou

## ACS Fellows Program

Nominations Deadline: April 1, 2023



"The American Chemical Society (ACS) Fellows Program was created by the ACS Board of Directors in December 2008 to recognize members of ACS for outstanding achievements in and contributions to science, the profession, and the Society. Read more about the [program purpose](#).

The nomination period for the 2023 Class of ACS Fellows is now open. Submit a nomination from February 1 to April 1." [Learn more](#)

## Employment Opportunity in Chemical Safety

IBM has an open position for a Chemical Coordinator. The position is located at the IBM Almaden Research Center in south San Jose, with responsibilities for western US territory.

Job posting: [Americas Chemical Program Manager - San Jose, CA | IBM Careers \(brassing.com\)](#)  
Contact Anais Nguyen, IBM Environmental Engineer, [anaisn@us.ibm.com](mailto:anaisn@us.ibm.com) with questions.



HARTNELL COLLEGE

# WE ARE hiring!



### Chemistry Adjuncts



#### Minimum Qualifications

Master's degree in chemistry OR bachelor's degree in chemistry or biochemistry AND master's degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent.

Join our STEM team!

Apply at

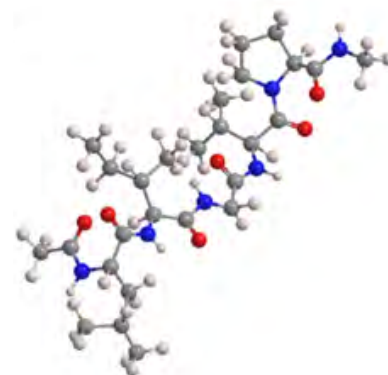
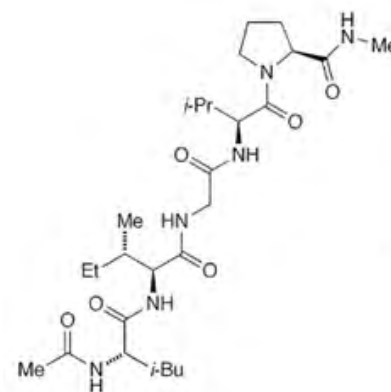
<https://www.hartnell.edu/hr/employment-opportunities-hartnell.html>

Interested candidates should contact Hartnell College STEM Dean Sharon Albert [salbert@hartnell.edu](mailto:salbert@hartnell.edu)

CHEMISTRY

# Quiz

I'm like a rubber band in your body.  
What molecule am I?



Answer

# Local Science Fairs in 2023

by Susan Hines

There is still room for you to join us on both the middle and high school SVACS Synopsys Championship special award judging teams. Additionally, category awards judges are desperately needed for all of our local county science fairs. It takes just one day of your time to judge at a local science fair – and all but two (Golden Gate and San Mateo STEM Fairs) are fully in person this year! Other than Sciencepalooza! on April 22, March is your last chance to help guarantee success in these qualifiers for student advancement to Broadcom Masters, the California State Science Fair, and the International Science and Engineering Fair, ISEF.

Please contact me at [svsefmgr@gmail.com](mailto:svsefmgr@gmail.com) to join our sponsored award team of dedicated chemists for the March 9, 2023, Synopsys Championship.

The following science fairs need category awards judges, especially in the areas of botany, biology, chemistry, microbiology, and behavioral science:

- San Mateo County Office of Education STEM Fair, March 4, 2023, virtual format  
<https://stemfair.net>
- Synopsys Championship: March 9, 2023  
<https://science-fair.org/judges-3/category-judges/judging-registration/>
- Santa Cruz County STEAM Expo: March 11, 2023  
<https://santacruzcoe.org/educational-services/curriculum-instruction/programs-services/academic-competitions/steamexpo/>
- Golden Gate STEM Fair: March 13, 2023, hybrid format  
<https://wp.ggstemfair.org>
- Alameda County Science and Engineering Fair: March 25, 2023  
<https://www.acsef.org/judges>
- Sciencepalooza!\*: April 22, 2023  
<https://outreach-foundation.org/programs/sciencepalooza/>

\*Many students at this competition are first time science fair participants.

So, no matter which fair(s) you choose, please volunteer now!

## Reactions Science Videos

Reactions is a video series produced by the American Chemical Society and PBS Digital Studios. Subscribe to Reactions at <http://bit.ly/ACSReactions> and follow on Twitter [@ACSReactions](https://twitter.com/ACSReactions).

Why calcium hydroxide + corn are key to understanding Western civilization and tacos



In the world of corn tortillas, a fierce debate rages: Is it okay to make them from pre-made corn flour, or do you need to go all the way back to dried corn kernels to make truly “from scratch” tortillas? We try to settle this debate and, in the process, understand a key moment in the foundation of

Western civilizations. [https://youtu.be/\\_LKe9hmXdvM](https://youtu.be/_LKe9hmXdvM) (posted Feb. 6, 2023)

Starch gelatinization, retrogradation, and the world’s fluffiest white bread



If you want to make the fluffiest bread possible, you’re going to need to use chemistry. This week, we explore the science behind starch gelatinization, a phenomenon found in Chinese “tangzhong” and Japanese “yudane” techniques. Then, we put it to the test to see how much gelatinized starch it takes to make the fluffiest, tastiest and most stale-resistant loaf! [Watch video and check out associated sources](#) (posted Feb. 15, 2023)

## Interesting and Cool Science in the News

**10 Breakthrough Technologies 2023** (MIT Technology Review, January 9, 2023)

**Advances in Lithium-Ion Battery Safety** (ACS Axial, February 15, 2023)

**AI in Publishing: The Ghost Writer in the Machine** (ACS Axial, February 16, 2023)

**AI is dreaming up drugs that no one has ever seen. Now we've got to see if they work.** (MIT Technology Review, February 15, 2023)

**Are your strawberries bland? Pesticides could be to blame** (ACS Press Release, February 27, 2023)

**Carbon-based conductor could herald cheap, bendable electronics** (News from Science, February 23, 2023)

**Carrots: Good for your eyes... and for degradable polymers** (ACS Press Release, February 21, 2023)

**Catalytic Techniques for Upcycling Plastic Waste** (ACS Axial, February 22, 2023)

**Chemical researchers discover catalyst to make renewable paints, coatings and diapers** (National Science Foundation Research News, February 22, 2023)

**Chemistry bots under threat from changes to Twitter's API rules** (Chemistry World, February 27, 2023)

**A day in the life of an experiment controls engineer** (SLAC News, February 13, 2023)

**Detecting rapidly mutating bacteria and viruses with AutoPLP** (ACS Press Release, February 15, 2023)

**DNA repair scheme gets closer look for cancer therapy** (National Science Foundation News, February 15, 2023)

**From polymers to prosthetics: the growth of 3D printing in biomedicine** (CAS Insights, February 11, 2023)

**Gelcapsules make reactions with organolithiums simpler and safer** (Chemistry World, February 16, 2023)

**Going Bananas Over Reducing Plant Food Waste** (ACS Axial, February 23, 2023)

**Harvesting Electricity from Succulents** (ACS Axial, February 9, 2023)

**Is nuclear energy critical in solving climate change?** (CAS Insights, February 9, 2023)

**Keeping drivers safe with a road that can melt snow, ice on its own** (ACS Press Release, February 16, 2023)

**Keeping SARS-CoV-2 closed for business with small molecules** (ACS Press Release, February 8, 2023)

**Lowering the risk of mother's sepsis or death after childbirth** (NIH Research Matters, February 28, 2023)

**Male contraceptive disables sperm** (NIH Research Matters, February 28, 2023)

**Mapping DNA damage from exposure to a compound in cigarette, industrial smoke** (ACS Press Release, February 22, 2023)

**The Micromotors Driving Injection-Free Insulin** (ACS Axial, February 13, 2023)

**A more healthful, gluten-free flour made from sweet potatoes** (ACS Press Release, February 13, 2023)

**New advances in recycling of lithium-ion batteries** (CAS Insights, February 17, 2023)

**New material for computer chips could reduce energy consumption** (National Science Foundation Research News, February 15, 2023)

**New theory provides answers to why metals have the structures that they do** (Chemistry World, February 28, 2023)

**Osteopontin may play key role in Alzheimer's disease** (NIH Research Matters, February 28, 2023)

**Polymer shows some backbone as it becomes first with extended metal spine** (Chemistry World, February 21, 2023)

**Possible new way to reduce pain inspired by chickens** (Stanford Medicine News, February 1, 2023)

**Quantum Leap: Cooling Buildings** (ACS Axial, February 14, 2023)

**Reactor experiment demonstrates alternative fusion scheme** (News from Science, February 28, 2023)

**Researchers can 'see' crystals perform their dance moves** (SLAC News, February 8, 2023)

**Single drug injection wards off COVID-19 hospitalizations, in Stanford Medicine-led trial** (Stanford Medicine News, February 8, 2023)

**SLAC, Stanford researchers make a new type of quantum material with a dramatic distortion pattern** (SLAC News, February 22, 2023)

**These sports sensors could curb 'bad calls' and help players during practices** (ACS Press Release, February 21, 2023)

**This loofah-inspired, sun-driven gel could purify all the water you'll need in a day** (ACS Press Release, February 8, 2023)

**This new sensor can detect mercury ions with just a tap (video)** (ACS Press Release, February 22, 2023)

**Toilet paper is an unexpected source of PFAS in wastewater, study says** (ACS Press Release, March 1, 2023)

**Using CRISPR to detect cancer biomarkers** (ACS Press Release, February 1, 2023)

**Voice-activated system for hands-free, safer DNA handling** (ACS Press Release, February 1, 2023)

**Wood that traps carbon dioxide could make buildings cleaner and greener** (Chemistry World, March 1, 2023)

### Call for Nominations

## 2023 Abraham Ottenberg Service Award Silicon Valley ACS Local Section

**Deadline: June 1, 2023**

The **Ottenberg Award** is presented annually to a member of our local section for outstanding service to the section.

Nominations include the nominee's biography, description of the service(s) for which the member is nominated, and a discussion or evaluation of the service to be recognized by the award. Nominations are not retained for subsequent years but re-nominations are accepted for consideration. Previous recipients are not eligible to receive it again.

Please send your nomination before June 1, 2023 by e-mail to [PFRusch@aol.com](mailto:PFRusch@aol.com) or by fax (650-961-8120) or by postal mail to:

Chair, Ottenberg Award Selection Committee

Silicon Valley Section

American Chemical Society

P.O. Box 395

Palo Alto, CA 94302-0395



# The chemistry of vinegar varieties



ACS Local Section  
Silicon Valley

P.O. Box 395, Palo Alto, CA 94302

Contact us: <https://www.siliconvalleyacs.org/about/contact/>

Website: <https://www.siliconvalleyacs.org/>

Sign up: [Newsletter](#)



### How is vinegar made?

Vinegar is produced by the two-stage fermentation of raw materials containing sugar or starch. In the first fermentation, yeasts convert sugar to alcohol (ethanol). In the second fermentation (acetic acidification) ethanol is oxidised to acetic acid by acetic acid bacteria.

### Distilled vinegar

Distilled vinegar is not itself distilled, but produced from distilled alcohol, made from barley malt or corn. Like other vinegars, the main acid is acetic acid (5-8% by volume). Other compounds are limited compared to other vinegars, but include traces of ethyl acetate.

### Balsamic vinegar

Traditional balsamic vinegar is made by converting sugars in cooked grape must to ethanol, oxidising to acetic acid, then ageing for at least 12 years. Researchers have identified 5-acetoxymethyl-2-furaldehyde as important to its long-lasting sweet taste.

### Wine vinegars

Wine vinegars are produced by fermenting wine. The main acid is still acetic acid, but other acids from grapes, such as tartaric acid, are present in smaller amounts. Phenolic compounds are also present, both from the wine and from barrel ageing for some varieties.

### Acetic acid

Acetic acid bacteria need oxygen to convert ethanol to acetic acid. In longer, traditional processes, the bacteria grow on the surface of the fermenting liquid. In industrial methods the bacteria are submerged, with oxygen pumped in.

### Apple cider vinegar

Apple cider vinegar is made from fermented apple juice. Like wine vinegar it contains other acids, such as malic acid from apples. Wine and cider also contain higher alcohols, such as propanol, which react to form additional acids and esters during vinegar production.

### Malt vinegar

Malt vinegar is made from fermented malted barley – essentially unhopped beer. Malt vinegars don't contain tartaric or malic acids, but do contain small quantities of lactic acid. Branched chain compounds, like 2-methylpropanoic acid, contribute to its flavour and aroma.

### Rice vinegar

Rice vinegar is made from fermented rice, and varies in colour from colourless to black. In some varieties, fural and pyrazines such as tetramethylpyrazine (TMP) contribute toast-like flavours. Buttery acetoin (3-hydroxy-2-butanone) is also present in many rice vinegars.

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