



# SOCIETY NEWS

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Dear Society Members and Friends of the Society,

I have decided to engage AI to help write this newsletter message. I will leave it to you to figure out what I personally wrote and what AI has written on my behalf. The future is now!

The old adage is alive and well. The only constant is change. We thought after the past couple of years we would get a moment to catch our breath, but what we are finding is the never ending change and pace that comes with it are here to stay. Some moments I am excited, others scared and sometimes just like whatever. No matter how you feel we are on a crash



## President's Message

**Scott Michaluk**

**2025—2026**

course with change. From predictive modeling of flavor interactions to AI-assisted formulation tools, the landscape is changing fast. As flavor chemists, we find ourselves asking: What is our role in this new frontier?

I believe our expertise which is rooted in sensory nuance, cultural context, and creative intuition remain irreplaceable. AI may accelerate certain processes, but it cannot replicate the artistry and human insight that define our field. Let's embrace these tools not as threats, but as collaborators in our pursuit of flavor excellence.

As I don't want to dwell too much here I want to turn to our upcoming schedule. From our January meeting at Chapman and our February meeting in ATL you will find we are mixing in some new locations and working to make sure the content is engaging and relevant. We hope you agree. If you don't I hope you join a committee to help make the content even better! It is the people that makes this Society so special and your support makes us better! As we turn to a more digital world it only makes these meetings and connection more relevant to all of us.

All that being said please visit the website and find a meeting or two to attend!

Hope to see you at a meeting.

*Scott Michaluk*

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# Tea Flavor and Formulation

*By Francois Lauverdiere*

Ever heard of tea? No! Not herbal tea, but what the botanists call *Camellia Sinensis*, a species of evergreen shrub or small tree in the flowering plant family *Theaceae*. Sound familiar? If you speak a latin-based language, *Theaceae* is close to *Tè*, *Thé*, and *Thee*. But you're not here to read about linguistics... I hope you're here to read about Flavor Chemistry! So buckle up and put the kettle on. Here we go!

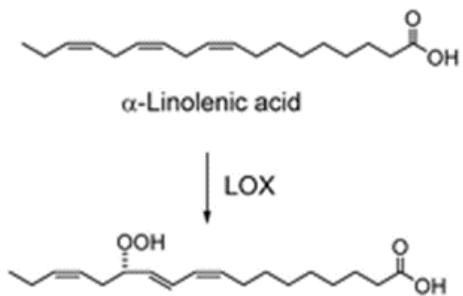
Taking a page from the Book of Wright<sup>1</sup> (Marie Wright, that is...), "So that this article (sic) does not turn into a book about tea..." let us focus our attention on Tea Flavour and Aroma Formation. I highly recommend reading Marie's succinct and elegant introduction from the Book of Wright before embarking on the present Flavour Adventure. She covers steeped black tea in her must-read chapter. Here, we will go a bit deeper.



*Camellia sinensis* (L.) Kuntze

Tea can be classified into different tea families according to its manufacturing process. We'll focus on 3 families for this article – unoxidized green tea, fully oxidized black tea, and semi-oxidized oolong tea. Fresh tea leaves are virtually odorless, but contain a myriad of compounds that undergo very specific reactions during processing. Tea derives its aroma molecules from carotenoids, lipids, glycoside precursors, and also from Maillard reaction.<sup>2</sup> Let's have a look at the key compounds responsible for the signature flavour of the 3 above-mentioned tea families and how they come to be in our fragrant cups.

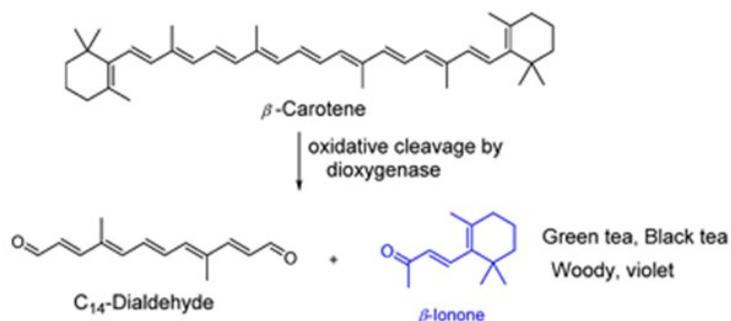




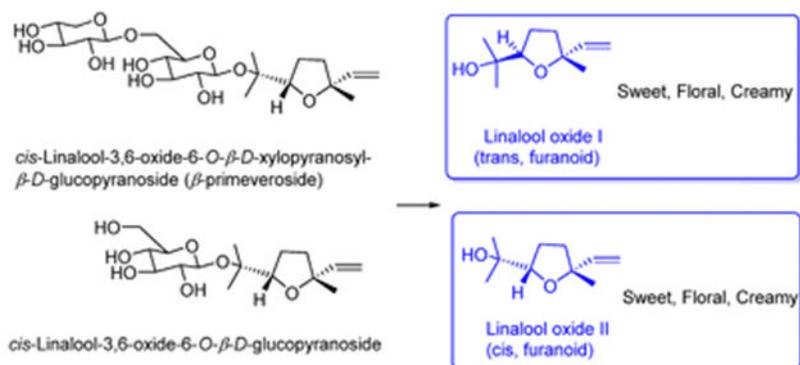
The green tea family includes world-beloved matcha tea & Dragon Well tea (or Long Jing for sinophiles). Green tea aromas range from fresh to floral and (obviously) green. Often overlooked and of great importance to the green tea aroma jigsaw are aldehydes and ketones derived from lipid oxidation. These provide pungent (pentenal), cucumber-like (2,6-nonadienal) and buttery (2,3-butanedione) notes and are produced via enzyme-assisted oxidation of fatty acids.

Also of significant (and surprising) contribution are Maillard-derived aroma compounds obtained during the baking step of the tea in order to dry the tea and stabilize it. Dimethyl sulfide and methional play key roles in character recognition of green tea and display high OAVs. Do try them next time you work on a matcha flavour!

Next up is the alluring oolong tea family. Oolongs are semi-oxidized teas and mostly produced (and consumed) in Asia. They are an awesome challenge to the flavourist because they cover a very broad range of aromas, from fruity and floral to woody and cookie-like. To me, they are a constant source of amazement and inspiration. Oolongs can be further distinguished as green

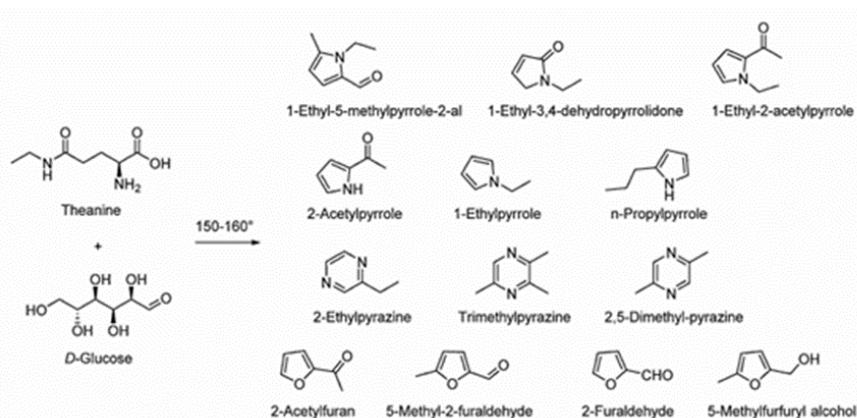


-type (fragrant and floral) or as dark-type (roasted and nutty) depending on processing. Important to both of these oolong types is one of my favourite aroma compounds – beta-ionone. This veritable Jack-of-all-trades (Jill-of-all-trades?) finds itself in oolong following non-enzymatic degradation of carotenoids found in the fresh tea leaf.



Floral compounds such as linalool and hoptrienol are key recognition compounds and are derived from glycoside precursors present in the fresh tea leaves. During processing, the leaves are bruised, releasing enzymes that hydrolyze glycosidic bonds and thus release volatile terpenes. In some cases, isomers are obtained, such as I, II, III, & IV Linalool Oxides.

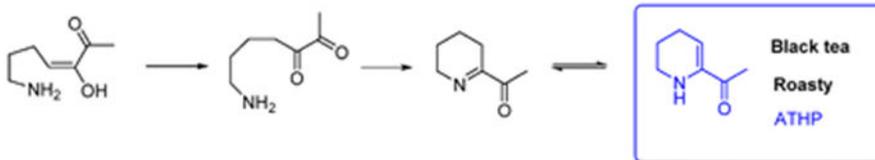
Oolong's delicious baked, cookie-like fragrances come from Maillard reaction between theanine and sugars such as D-Glucose that are present in the tea leaf.



Last, but not least is everybody's favourite— rich, mellow and complex black tea. Black tea is fully oxidized during processing and also baked to dryness. These processing steps result in formation of many volatiles.

Enzyme-assisted degradation of carotenoids produce herbal and spicy safranal and another one of my all-time favourites, beta-damascenone. This compound is found in black tea, thanks to a complex and impressive cascade of reactions that involve allenic triol, which for the organic chemistry nerds out there, contains a rare and unstable back-to-back double-bond!

In another true feat of nature, black tea's signature and comforting aroma of malty goodness is derived from pyrroles and pyrazines that come about



during the baking of fully oxidized tea leaves. 2-Acetyl TetraHydro Pyridine (ATHP) is one such compound that also exhibits an impressive threshold value of 0.1 parts-per-billion in water.

Next time you prepare a nice cup of tea, please remember the amazing flavour chemistry that happens inside every tea leaf. Enjoy!



#### References –

- 1 – Wright, J. et al., *Flavor Creation*, 2<sup>nd</sup> Edition, Allured Books, 2011, 382 p.
- 2 – Ho, C.-T., Zheng, X., Li, S., *Food Science and Human Wellness*, 4, 2015, 9–27.
- 3 – Flaig, M. et al., *European Food Research and Technology*, 246, 2020, 2411-2425.



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**475th Meeting of The Society of Flavor Chemists, Inc.**  
**Thursday, September 25, 2025**  
**Chandler’s Chophouse Grille & Banquets, Schaumburg, IL**

*Presentation summaries contributed by Joshua Jackson from Sensient*

## The Ultimate Puzzle Navigating the Challenges in Sugar Reduction

The presentations for the September meeting that took place in Chicago, IL were kicked off by **Harry Fink of Treatt**. Harry presented to attendees the challenges that the industry currently faces with formulating products that contain less sugar without sacrificing flavor. He opened with a brief overview of Treatt’s capabilities and areas of expertise with a focus on citrus and sugar reduction technology. With healthier lifestyles being a concern for consumers, Treatt’s innovations in sugar reduction are helping to create better-for-you products with end functionality benefits that do not compromise overall product taste.



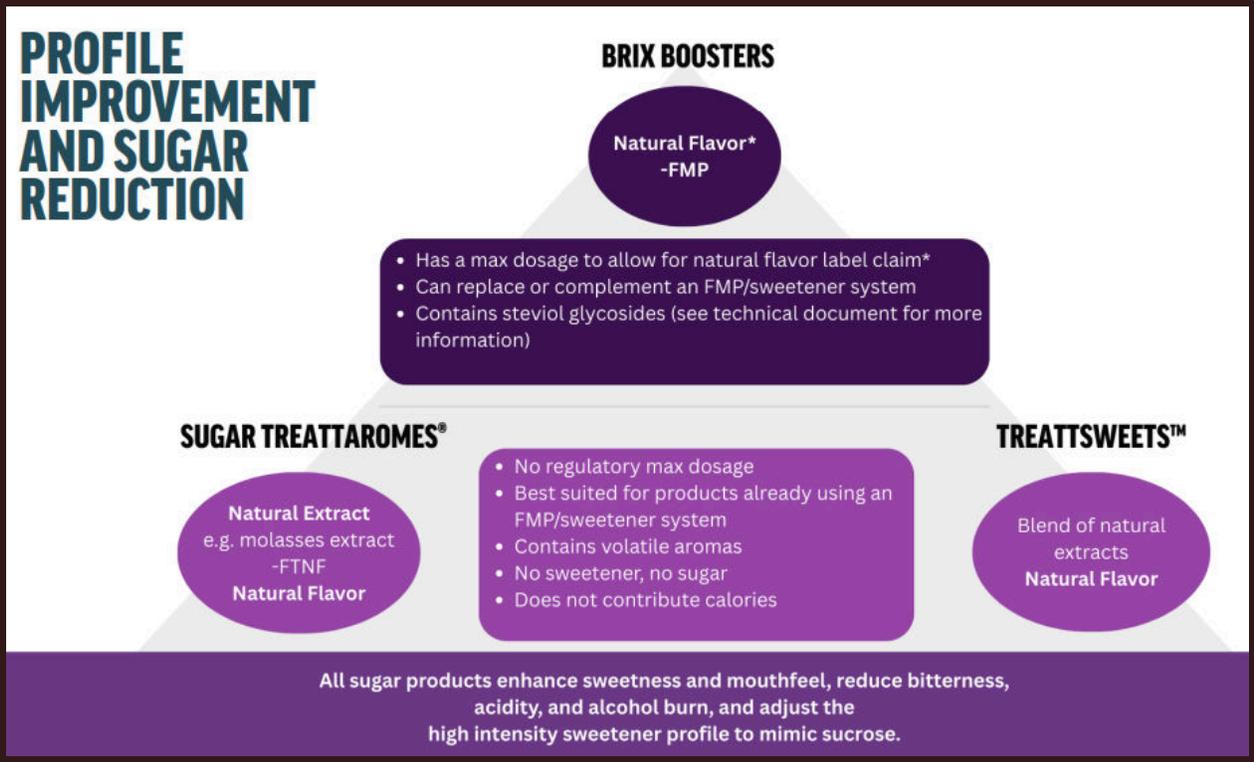
Sugar is considered the gold standard sweet component in products due to the clean, well rounded sweetness profile, ability to provide bulk and textures to the finished product, and for its ability to enable caramelization and browning for flavor and color purposes. The challenge to replacing sugar is the ability to mimic all of these characteristics as well as simulating the same sweetness intensity curve over time.

The current sugar reduction landscape can be broken down into three categories. These categories include high intensity artificial sweeteners, which include aspartame, sucralose, and ace K; natural high intensity sweeteners that include stevia and monkfruit; and up and coming sugar trends such as allulose and sweet proteins. Taking the current landscape into consideration, Treatt is working to develop different types of technologies to help customers stay ahead of market trends. Examples of technologies that are being utilized by Treatt include their Sugar Treattaromes, TreattSweets, and Brix Boosters.

### WHY WE’VE ALWAYS LOVED SUCROSE

- Clean, well-rounded sweetness with an immediate flavor impact and no aftertaste
- Provides bulk and texture in finished product
- Heat stable - enables caramelization and browning for flavor/color
- Important caloric source for rapid energy boost

Sweetener	Relative sweetness	Sweetener	Relative sweetness
fructose	1.2–1.8	saccharin	250–550
sucrose	1.00	aspartame	120–200
glucose	0.60	sucralose	550–750
maltose	~0.5	cyclamate	30–50
lactose	0.15–0.30	acesulfame K	~200
galactose	0.32	alitame	2000



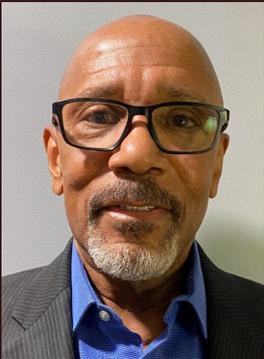
Treatt’s Sugar Treattaromes and TreattSweets are designed to improve the overall profile of systems that already include flavors with modifying properties (FMPs) or sweetener systems. These technologies do not have any maximum regulatory doses due to not containing FMPs but rather work with sweeteners in the product to create a more well-rounded sweetness profile. Brix Boosters take this a step further by combining an FMP with a Treattarome or TreattSweet to provide a single complete sugar reduction solution.

During the meeting, attendees had the opportunity to taste two different demos from Treatt; one in water and the other in an RTD iced tea beverage. These demonstrations showed a more complete sugar-like profile than the controls provided. ❖❖❖



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# Ask A Perfumer



Roger Howell, president of the American Society of Perfumers, presented next on how a perfumer would



smell and evaluate different types of citrus oils. The presentation included a hands-on demonstration that allowed attendees to smell and evaluate five different types of citrus oils alongside Roger.

The citrus oils that were provided included Mexican lime type A, Mexican lime type B, Kaffir lime from Thailand, Makrut lime, and a calamansi. Roger explained that all

of these materials included 214 different aroma compounds that were identified via gas chromatography, however there were distinct differences in the quantity of these identified compounds that attributed to differences in sensory perception.



## Distinctive Chemical Signatures

Mexican A	Mexican B	Kaffir	Makrut	Calamansi
<b><math>\alpha</math>-Terpinene rich</b>	<b>High sesquiterpenes</b>	<b>Citronellal dominant</b>	<b>High <math>\beta</math>-Pinene</b>	<b>Highest d-Limonene</b>
<b>14.4%</b>	<b>17.1%</b>	<b>42.0%</b>	<b>16.9%</b>	<b>82.1%</b>
<ul style="list-style-type: none"><li>• Unique to this oil</li><li>• High <math>\gamma</math>-terpinene</li><li>• Herbaceous notes</li></ul>	<ul style="list-style-type: none"><li>• <math>\beta</math>-Bisabolene (5.6%)</li><li>• Citral presence</li><li>• Complex profile</li></ul>	<ul style="list-style-type: none"><li>• Only aldehyde-dominant</li><li>• High linalool (6.8%)</li><li>• Floral alcohols</li></ul>	<ul style="list-style-type: none"><li>• Double terpinolene peaks</li><li>• Balanced monoterpenes</li><li>• Woody undertones</li></ul>	<ul style="list-style-type: none"><li>• Very pure citrus profile</li><li>• Minimal aldehydes</li><li>• Low sesquiterpenes</li></ul>

As each different citrus oil was presented the unique aroma characteristics were touched upon. Roger perceived the Mexican lime type A to have a strong herbaceous and earthy citrus note due to its high  $\alpha$ -terpineol content. The Mexican lime type B was more balanced in citrus

profile with a sweet, woody, and slightly spiced finish. Roger specifically expressed that the Kaffir lime would be a unique and interesting addition to a perfume due to the distinct floral fragrance that comes through along with the typical lime notes. The Makrut lime was the most green and resinous, having a complex terpenic character. The final sample of calamansi oil had a high level of d-limonene which Roger explained was attributed to it being harvested as a younger citrus fruit. The oil aroma contained more orange and lemon notes which provided a sweet and fresh citrus profile.



After the smelling portion was completed, Roger answered a few questions relating to the perfume industry. He provided insight into creating a complex perfume and said the most important aspect was a top note that draws in the consumer, a middle note that characterizes the overall perfume profile, and a bottom note that should linger. He stated that there are a lot of similarities between materials that are used in flavor and perfumes but that there can also be variations due to the nature of the final application. One of the last questions that was presented to Roger pertained to the longevity of citrus oils and how it could be prolonged when used in perfumes. As is seen in the flavor industry, citrus oils quickly oxidize which alters the sensory profile and many of the attendees were interested if this same issue presents itself when developing perfumes. Roger responded that it is a common occurrence in perfumes as well. The oxidization is slowed by perfumers typically storing citrus oils in freezers and minimizing the headspace of the oils. When creating a citrus perfume, individual aldehydes and other top notes need to be added to ensure longevity and extend the life of the citrus profile. ❖❖❖



# Unveiling the Mysteries of Chromatography and How It Can Tell Us What Blue Smells Like



**Dr. Lee Polite, of Axion Analytical Labs**, presented on gas and liquid chromatography. His goal during his presentation was to give the attendees a baseline understanding of chromatography and debunk the myth that chromatography has to be complicated.

The basics of understanding chromatography start with the equipment that is used as well as what chromatography actually is. In Dr. Lee's words, chromatography is really an umbrella of techniques focused on separation of materials with the mobile phase of the technique dictating how the technique is named. For example, the mobile phase for gas chromatography (GC) is gas whereas the mobile phase for liquid chromatography (LC) is liquid. According to Dr. Lee, GC has fewer moving parts and is overall less complex than LC; however when choosing which one to utilize the rule of thumb is if you can smell it use GC, if you can dissolve it use LC.



Dr. Lee explained that the reason why we want to separate materials is to identify, quantify, and purify. At its core, chromatography separates analytes based on their relative affinity for the stationary phase being used in the analytical equipment. Materials will come out faster from the machinery if they have less affinity for the column being used. Dr. Lee stated that the dominating factor for the speed with which an analyte passes through a GC column is the boiling point of a molecule. If a molecule has a low boiling point it wants to stay in its gas phase and will move quickly through the column and if it has a high boiling point it will want to stay as a liquid. The secondary factor is the chemistry of the molecule. This can be simplified into whether the molecule is polar or non-polar. The stationary phase of the column used determines the selectivity of the technique and can be adjusted to alter the separation.

Dr. Lee proceeded to perform a demonstration using a handheld mini non-polar LC column. Using grape flavored (purple colored) Kool-Aid, he injected a sample into the column and then used three different mobile phases (water, 10% ethanol, 75% ethanol) in an attempt to separate the color. He started with the water mobile phase to demonstrate the importance of polarity when conducting chromatography. Upon pushing the water through the column only clear liquid eluded. Based on this information it can be inferred that the color components had a stronger affinity for the stationary phase and must be non-polar to some degree. He then changed to 10% ethanol and repeated the process, which yielded a pure red color eluding from the column. This indicated that the



red color was more polar than the blue color which is why it eluded while the blue remained. It was not until the use of 75% ethanol that the blue color was finally collected from the column, which indicated that the blue color was the most non-polar. Along with the visual demonstration, Dr. Lee also distributed cups of the fractions gathered from the column for participants to smell. It was discussed that the strongest grape aroma was noted in the final blue sample, which would indicate that the majority of the aroma compounds are non-polar. ❖❖❖



## FlavScents



**FlavScents cofounder, Tony Moore**, presented next on the online database that he and his cofounders developed. FlavScents is a non-profit group run by volunteers that is dedicated to serving the flavor and fragrance industries. Volunteers include community members from the flavor and fragrance industries who are passionate about their work.

The database includes a material search function where users can look up material data including identifiers, properties, and organoleptic characteristics. It also serves as a resource to find material suppliers and supplier documentation. There are customization options available for users to personalize their experience, these include private general and sensory notes and the ability to favorite materials. Upcoming planned improvements to the database include a supplier metric dashboard, improved supplier material listings, and supplier and sponsor manage-

ment tools for the administration team. A future goal that is being worked towards is an automated method of pulling up to date material information from other web based sources. The current method of updating material information is all manual which introduces potential for the information to be outdated. FlavScents strives to provide accurate and up to date information and this automated system

Aside from encouraging industry professionals to sign up for the free database subscription, FlavScents has three primary goals: build supplier listings, expand material information, and establish volunteers and partnerships. At the time of the meeting and presentation, FlavScents has over 1,200 subscribed users and has performed over 15,000 searches for different raw materials and is rapidly expanding. They have started compiling different groups of volunteer teams, including new FEMA GRAS team, system improvement team, fragrance/perfumer team, savory & sweet sensory team, and a flavor with modifying properties team. They encourage anyone interested in volunteering to contact them. ❖❖❖

## What exactly is flavor? Cinnamaldehyde, Strawberry, Blue, Home...?

The final presentation of the day was conducted by **Donya Stubbs of Matrix Sciences**. The topic of her presentation was the consumer expectation of food products. She led off her presentation with an example of a company that made maple flavored baked beans to be sold on the Canadian market. The initial iteration of the product failed due to the company's lack of understanding of, in Donya's words, what maple means to Canada. It was not until members from the company experienced going to a sugar shack in Quebec to see the maple syrup process from start to finish that they were able to succeed in producing a product that met the consumers' expectations of the flavor.

This anecdote was used to illustrate the point that flavor can mean different things to different groups of people. She stated that while we are all in a business that focuses on trends and selling product, the most important thing to consider when creating a new product is to think about the consumers and how their experiences influence their purchasing inclinations. An example that she gave in regards to this point was the fact that 70% of coffee consumed in Canada is from Tim Horton's. Knowing this, if a coffee flavored product was to be marketed towards Canadians it would be most likely to succeed if the profile closely resembles Tim Horton's coffee.

The goal of her presentation was to bring the business and consumer sides of product development closer together. Even within a company, different departments will have different focuses with regards to product development. For example, quality assurance will be more focused on consistency and comparability to a gold standard while culinary arts will be more focused on creativity and the experience of the flavor while being consumed. While these two departments have different focuses, the different points of views are important for creating a successful product. Donya broke down the factors that influence a customer's interests into seven categories. These categories include memory, habit, value, nostalgia, culture, brand, and family. All of these factors must be considered by the product development team. One of the methods that a business can employ to hear from the consumer is via sensory research. Quantitative methods such as utilizing a trained sensory panel to perform a descriptive analysis panel or qualitative methods such as in person or online focus groups can be used to collect market opinions. Ultimately, all of the information collected from the different business departments and the consumer preferences needs to be considered to make a desirable product. ❖❖❖

















**476th Meeting of The Society of Flavor Chemists, Inc.**  
**Thursday, October 16, 2025**  
**Doubletree by Hilton, Newark, NJ**

*Presentation summaries contributed by Sharen Jean Baptiste from Sensapure*

## Kick or Treat

This meeting was focused on exploring the sweet side of the Flavor industry. **Siobhan Twohig, Director of Sales-Ingredients from Robertet**, kicked off the meeting by exploring emerging sweet and spicy trends in the confection space. The first trend that Twohig explored was the sweet resurgence of coconut flavors in the food space. Coconut, *Cocos nucifera*, is a tropical fruit that is quite versatile. It provides refreshing milky notes to a drink, cooked coumaric notes to a cookie, and tropical bliss to a



Pina Colada mocktail. Twohig had the audience evaluate two different types of extraction methods to demonstrate the dynamic flavor profiles of coconut.



### Coconut C02 Extract

Origin: Philippines  
 Part used: fruit  
 Process: supercritical C02 extraction.  
 Taste: coconut meat, lactonic, milky  
 Evaluation: 300ppm in water

### Coconut Kiinote® Organic

Origin: Sri Lanka  
 Part used: fruit  
 Process: alcoholic/aqueous extraction  
 Taste: fatty, fresh coconut  
 Evaluation: 2.5% in water

The second trend that Twohig presented on was the spicy take on Sichuan Peppers. Sichuan peppers are in the top three global emerging peppers. Shockingly 30-35% of consumers have yet to hear about this small pepper that has a numbing impact. The Sichuan Pepper, *Zanthoxylum piperitum*, originates from China. It is used in dishes such as Hot Pot, chicken, pork and stir-fries. Twohig had the audience evaluate three different types of Sichuan peppers highlighting the impact of different extraction methods on the flavor profile of Sichuan pepper.

Lastly, Siobhan presented a pumpkin spice flavored truffle for a spicy sweet ending. While not new to the market, pumpkin spice remains a strong seasonal trend that embraces tradition and excitement due to its limited time offerings.



### Sichuan Pepper Co2 Extract

Process: supercritical CO2 extraction

Taste: fresh, peppery spice, flowery lavender, geraniol, citronellol

Evaluation: 10ppm in water

### Szechuan Pepper Kiinote®

Process: extraction in ethanol

Taste: sharp, citrus, pungent, licorice notes

Evaluation: 0.5% in water

### Szechuan Type Oleoresin

Process: solvent extraction

Taste: sharp peppery bite, numbing

Evaluation: 0.5% in water



## *Chew on This:*

### *The Science of Candy Texture and Impact on Flavor Perception*

This was a joint presentation between **Sarah Waxman Tulley, Ph.D., Food Applications Innovation Lead** and **Curtis Lockett, Ph.D., Director of Sensory** at **Ingredion** to understand the important roles that texture plays in flavor perception.



### **Chew on This: The Science of Candy Texture and Impact on Flavor Perception**



Waxman opened the presentation with a lecture on the basics of food texture. The perceived texture of food is heavily influenced by the physical structure of food, and in the case of the meeting, candy! The two main types of candy physical structure fall under Crystalline and Amorphous. Under these main structures come a wide range of candy textures (sticky, bouncy, gummy, waxy, glassy, etc.). Amorphous candies are formed from rapid cooling of a supersaturated syrup. They do not have crystallization and they tend to form a glassy and brittle structure. An example of this is hard candy. Crystalline candies are formed from a controlled cooling and agitated environment on a supersaturated syrup. These parameters produce crystallization leading to a short and chewy structure with fine crystals. An example of this is caramel soft candy. Some candies fall under the category of Polymeric Gels. Examples of these are gummies. They can be amorphous or semi-crystalline in nature. Last but definitely not least, polymorphic crystalline structures were introduced. A gold standard example of this type of structure is Chocolate. Chocolate is crystalline in structure, glossy in appearance, and have a melt-in-the-mouth texture.



While Waxman laid the foundation of texture, Lockett presented on “*How Texture Influence Flavor.*” There are three main mechanisms for how flavor is modulated by good texture.

- **Cognitive selective attention**—An example of this is evaluating cherry juice at different sweetness levels and texture types. A 13% cherry juice solution taste just right. However, if you increase the sugar level to 46% the cherry juice is no longer desirable. Contrastingly, if you add gelatin to this same 46% sugar cherry juice solution, it becomes a gummy and is now desirable again.
- **Oral processing based**—This is a classic example of retronasal processing. The air flow and bolus properties impact the release and perception of flavor.
- **Surface area to volume ratio of particles**—Foods with greater surface area have a higher release of flavor molecules into the air of the mouth. Foods with greater surface area increase the interaction of flavor molecules with taste buds.

Number of chews and rate of chews impact the flavor perception as well. In general, there is a direct positive correlation between the number of chews and the perceived sweetness of candy. The reason for this is that the surface area of the bolus is increasing. The rate at which someone chews their food can alter the experience of the food as well. Fast eaters may experience a greater flavor intensity and sooner than slower eaters because as they chew they are allowing more air flow into their mouth (Retronasal processing effect).

The interaction between flavor, texture and the properties of chewing are interdependent. The perception of food is based on the texture, and the texture impacts the chew, and the chew then impacts the perceived flavor.

Lastly, Waxman presented the concept that the expression of volatiles for a flavor is greatly impacted by the firmness of the food item. He used the example of strawberry gelatin candies to demonstrate this. When firmness was increased the strawberry notes, sour

notes and peach like notes were experienced later by consumers. While in a softer candy, the strawberry profile was experienced sooner. ❖❖❖



## Behind the Smoke and Mirrors: Using a combination of GC-MS-O and NMR to understand Smoke Flavor

**Tim Vazquez, Ph.D., Research Scientist at Kerry in collaboration with The Ohio State University and Red Arrow**



In this presentation, Vazquez explored the breakdown of wood during pyrolysis, focusing on how the chemical structure of wood components contributes to the development of distinct smoke aromas. Pyrolysis is a thermal decomposition process that breaks down wood into three primary phases: gas, liquid, and solid. The gas phase, which is rich in volatile compounds, plays a crucial role in the flavor of smoke. These gaseous compounds, including acids, aldehydes, ketones, furans, pyrans, and phenolics, are condensed to form what is commonly known as liquid smoke. The production process begins with wood sawdust, which undergoes pyrolysis to create a mixture of gases, liquids, and solids. After-

ward, the gaseous byproducts are passed through a condenser, separating unwanted organic waste (such as tar and polycyclic aromatic hydrocarbons, or PAHs) from the desired liquid smoke condensate.

Vazquez's research focused specifically on identifying the volatile compounds responsible for the authentic aroma of smoke. The goal was to determine which compounds were most representative of true smoke flavor and to understand how they were formed. To do this, a comprehensive process flow was established: the condensed smoke undergoes Aroma Extract Dilution Analysis (AEDA), followed by quantification, and then sensory validation. AEDA, which involves gas chromatography-olfactometry (GC-O), is used to identify and analyze the aromatic compounds in the smoke. By generating samples through rapid thermal pyrolysis of wood and performing serial dilutions, researchers inject each dilution into the GC-O and have trained panelists record aroma descriptors and retention times for the detected odorants. The serial dilutions continue until the aroma becomes undetectable, allowing researchers to pinpoint the most impactful compounds.

For sensory validation, the recombinant model was utilized to recreate the identified compounds at their quantified levels. Vazquez compared the re-created aroma to that of concentrated liquid smoke to test its relevance and accuracy in representing authentic smoke flavor. The sensory panel

identified key descriptors for the smoke, including ashy, smoky, spice-sweet, woody, green-woody, burnt-sulfurous, creosote, and pungent. These sensory descriptors helped confirm which volatile compounds were most responsible for the characteristic smoke aroma, and how they interacted to create the complex sensory profile that defines wood smoke.

The study also explored the interaction of different wood components during pyrolysis, revealing how cellulose, hemicellulose, and lignin decompose at varying temperatures and release different volatiles. Notably, cellulose decomposes in a way that absorbs energy, creating an endothermic reaction, while lignin's breakdown leads to the formation of aromatic phenolic compounds, which are key to the smoke's distinctive odor. This chemical interaction not only explains the aroma of the smoke but also highlights the importance of wood type in determining the flavor profile. For example, mesquite wood produces a more intense smoky aroma, while applewood creates a sweeter, milder flavor.

In summary, this research provided valuable insights into the molecular mechanisms that underlie the formation of wood smoke aromas. By analyzing the chemical composition of wood components, understanding their decomposition pathways, and correlating these findings with sensory analysis, the study contributed to a deeper understanding of how different wood types produce distinct flavors. ❖❖❖

#### LIGNIN DERIVATIVES

COMPOUND	AROMA DESCRIPTOR
2,6-Dimethylphenol	burnt, phenolic, ashy
o-Cresol	green, pine, phenolic
2-Ethylphenol	ashy
2,5-Dimethylphenol	sweet burnt
2,4-Dimethylphenol	burnt smoky
p-Cresol	burnt, plastic, clove
m-Cresol	burnt, plastic, clove
4-Ethylphenol	ashy
3-Ethylphenol	ashy
3,4-Dimethylphenol	sweet, ashy

**KERRY** | Red Arrow



THE OHIO STATE UNIVERSITY

# Sugar Reduction- Trick the Mind, Treatt the Senses

Caron Provatopoulos, R&D Scientist at Treatt outlined the growing challenges and opportuni-



ties in sugar reduction, emphasizing both consumer demand and the technical complexities involved. She began by explaining that humans are biologically predisposed to prefer sweetness, as it historically signaled energy and safety. Despite this innate preference, shifts in health awareness and regulatory pressures are driving significant reductions in sugar across the food and beverage industry.



Provatopoulos described the current sweetener landscape, which includes artificial high-intensity sweeteners such as sucralose, natural options like stevia and monk fruit, and emerging ingredients such as allulose and sweet proteins. Each category offers unique advantages but also notable limitations, including bitterness, off-notes, cost constraints, and regulatory challenges. Because no single sweetener fully replicates the clean taste and functional performance of sucrose, brands increasingly rely on blends to approximate sugar's sensory profile.

## SUGAR REDUCTION LANDSCAPE

Traditional HIS (*Aspartame, Sucralose, Ace-K*)

- Cost-efficient, widely used
- Perception challenges (artificial, aftertaste)

Natural HIS (*Stevia, Monk Fruit*)

- Clean-label, plant-based
- Off-notes + higher cost remain hurdles

Emerging (*Allulose, Rare Sugars, Sweet Proteins*)

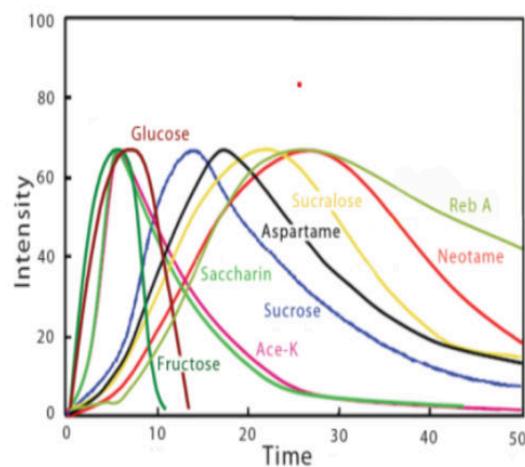
- Sugar-like taste, functional benefits
- Regulatory & scale limitations today

**Blends of HIS + natural + emerging solutions will shape the future, with flavor optimization as the key to winning.**

## SWEETENER OVERVIEW

- Tradition Caloric Sweeteners – Sucrose, HFCS, etc
- Artificial HIS – Sucralose, Aspartame, Ace-K, etc
- Natural HIS – Stevia, Monkfruit, etc

\*\*Each sweetener exhibits distinct sensory properties—including onset, duration, and relative sweetness—and formulators use a combination of low- and no-sugar tools to approximate the sweetness curve of sucrose as closely as possible



Treatt's role in this evolving landscape was presented as that of a strategic partner rather than a simple ingredient supplier. The company uses proprietary technologies that capture natural volatile compounds from sugarcane or molasses to enhance sweetness perception through aroma pathways, particularly retronasal olfaction. These technologies help smooth the harshness of high-intensity sweeteners, reduce bitterness and acidity, improve mouthfeel, and create a more

## TREATT SUGAR REDUCTION TOOLS



### SUGAR TREATTAROME®

- Sugar extract (FTNF)
- Sucrose free
- Reduces sugar by 1Brix when used alone, increasing further with FMPs
- Labelled as natural sugar flavor/extract



### TREATTSWEET™

- Sugar flavor
- Sucrose/fructose free
- Reduces sugar by 1Brix when used alone, increasing further with FMPs
- Labelled as natural flavor



### BRIX BOOSTERS

- Flavor with modifying properties (FMP)
- Reduces sugar by 1.5Brix when used alone, increasing further with FMPs
- Labelled as natural flavor

balanced, sugar-like flavor experience. Treatt's product families, including natural extracts, blended sweet enhancers, and brix boosters, are designed to support clean-label goals while improving the taste and performance of reduced-sugar applications.

Provatopoulos introduced two Treatt products to the audience against control samples: TreattSweet 9857 and TreattSweet 9864. The sensory testing results shared in the presentation demonstrated that formulations incorporating Treatt's solutions show increased perceived sweetness, reduced off-notes, and a closer resemblance to sucrose.

## SWEETENERS + TREATT TECH A BETTER BALANCE

### WHAT YOU'LL TASTE

See how Treatt technology elevates traditional sugar-reduction tools for a more balanced profile:

- Stevia + Water
- Stevia + TreattSweet 9857
- Iced Tea Control
- Iced Tea + FMP
- Iced Tea w/FMP + TS 9864



### TREATTSWEET™ 9864 ICED TEA WITH FMP

TreattSweet™ 9864 is a unique product that combines natural essences of molasses, dried fruit and cereal notes. It can be used as a standalone sugar sweetness profile when used in combination with natural or synthetic sweeteners. In a sensory testing demo with reduced sugar and the use of an FMP, TreattSweet™ 9864 further reduced the acidity perception, whilst reducing the bitterness and aftertaste.

**PARTICIPANTS SCORED THE MODIFIED VERSION 15% HIGHER ON PREFERENCE THAN THE CONTROL + FMP VERSION**

### FORMULATION

INGREDIENTS	CONTROL +FMP %	MODIFIED %
Water	94.831	94.791
Sugar	4.500	4.500
TrueTaste™ Black Tea	0.500	0.500
Citric Acid	0.095	0.095
Malic Acid	0.034	0.034
Ascorbic Acid		
Trisodium citrate		
TreattSweet™ 9864		
FMP (Glycosylated Steviol Glycosides)*		
Total		

\*FMP Steviol equivalents in formulation: 21mg/kg.

### REGULATORY

- Kosher
- GMO Free
- Vegan
- Labelled as natural flavoring



HEALTH & WELLNESS

www.treatt.com

The presentation concluded by reinforcing Treatt's ability to help brands deliver reduced-sugar products that maintain flavor integrity, cost efficiency, and consumer appeal, positioning sugar reduction not as a compromise but as an opportunity for innovation.



# Tricks and Treats of Flavor Science

**Kathryn Deibler, Ph.D., Consultant in Flavor Essentials.**

Deibler’s hands-on flavor science session provided an engaging overview of how taste, smell, genetics, and context work together to shape our perception of food. Through a series of practical demonstrations, the audience experienced the multisensory nature of flavor and the significant individual differences that influence it.



## 1. Flavor Depends on Smell: The Jelly Bean Test



The session began with a demonstration highlighting the importance of smell in flavor perception. Participants tasted jelly beans with and without smelling them, clearly illustrating that aroma is essential for recognizing flavor, while taste alone provides only basic sweetness, sourness, bitterness, saltiness, and umami.

## 2. Genetic Variation in Bitter Perception (PTC Test)

Participants sampled PTC strips to assess their sensitivity to bitterness—a known genetic marker. Results ranged from “extremely bitter” to “no taste,” reflecting variation in the T2R38 bitter receptor gene. This exercise demonstrated why individuals often differ in food preferences and bitterness tolerance.



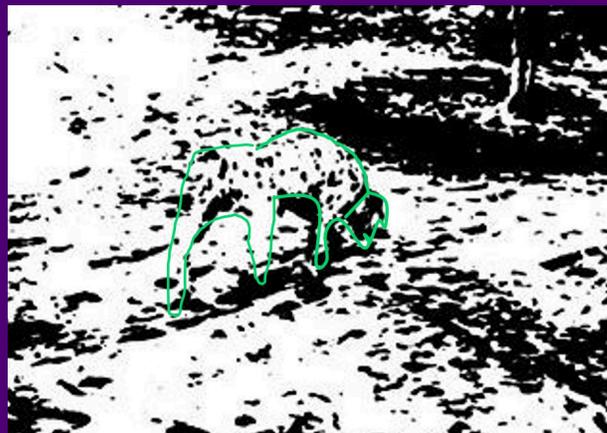
## 3. Individual Differences in Smell Perception

With approximately 400 olfactory receptors and significant genetic variability, individuals can differ substantially in how they perceive aromas. Some people experience specific anosmia, where certain compounds are undetectable to them, illustrating the highly personalized nature of olfactory perception.



#### 4. Pattern Recognition in Flavor Identification

Visual illusions, such as the Dalmatian image composed of scattered dots, were used to explain how the brain fills in gaps to create coherent patterns. This process underlies how people consistently identify familiar flavors despite biological differences—our brains construct stable “flavor templates” over time.



#### 5. Taste Adaptation & Mixture Suppression: Lemonade Demonstration

A three-sample lemonade trial demonstrated how previous stimuli shape taste perception:

- Increased sugar reduced perceived sourness.
- Additional acid intensified sourness.
- Returning to the original sample altered perception due to adaptation.

These effects illustrate the importance of sensory sequencing and mixture interactions in product development and sensory evaluation.



## 6. Multimodal Integration: Flavor Recovery in Chewing Gum

When participants added sugar to flavor-depleted gum, the flavor seemed to “return,” despite no additional aroma compounds being present. This demonstrated how sweetness and aroma cues interact, and how the brain integrates multiple sensory inputs to form a unified flavor experience.

## 7. Visual Influence on Perception: The McGurk Effect & Color Cues

A demonstration of the McGurk effect showed how conflicting visual and auditory cues can alter what a person believes they heard. This cross-modal influence parallels flavor perception, where color and appearance strongly shape expected taste, sometimes overriding chemical reality. Case studies highlighted that even trained tasters can describe the same product differently when color cues change.



## 8. Context Shapes Aroma Interpretation

In the final demonstration, participants smelled Sulfurol multiple times while viewing different images. For example if an image of Chicken was shown, the audience might perceive Sulfurol to smell like chicken. When an image of Milk was shown the audience perceived the Sulfurol to smell like milk, or steamed milk. This reinforces that expectation and context significantly guide aroma interpretation.

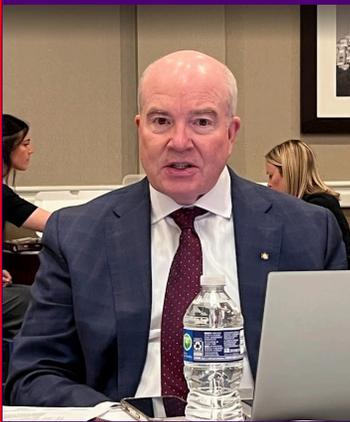


This presentation emphasized that flavor is not a single sense but a multisensory, cognitive experience. Genetics, olfactory variability, sensory adaptation, visual cues, and contextual expectations all contribute to how individuals perceive and evaluate flavor. ❖❖❖













SFC Members at the FEMA 2025 Fall Symposium. Debra Merritt (ADM), Derek Rankin (Sovereign Flavors), Rachel Odolski (Coke), Paul Nguen (American Fruit & Flavors), Dolf DeRovira (Flavor Dynamics), Melissa Barbercheck (ADM), Lauren Wachenfeld (ADM), Rovbert Pan (Sweegen), Lauren Muhlberger (Sovereign Flavors), Greg Griffin (Brookside Ingredients), Kelly Carroll (Robertet), Justin Kozlowski (Bell F&F), Marie Wright (Mystic Flavours), Jennifer Augelli (Givaudan), Elsa Howerth (Kerry).

# New Members & Upgrades

*Welcome & Congratulations!*



**RACHEL ODOLSKI**  
The Coca-Cola Company  
Upgraded to Certified  
Sept 25, 2025

With an infectious enthusiasm for life and endless curiosity, I am passionate about exploring the world of flavors and making a positive impact. I hold a BA in Biology from Cardinal Stritch University, where I was a two-sport student athlete and Dean's List student. Currently, I am continuing my education by pursuing an MBA at Kennesaw State University. I am originally from the Chicago suburbs, but now reside in the northern suburbs of Atlanta. Outside of work, I enjoy renovating my home, working out, learning new things, hiking, and spending quality time with my family and friends. I am fortunate to have the support of my husband, Jeff, our three cats—Sargento, Miller White, and OneEyed Willie—and our Golden-German Shepherd dog, Moose.

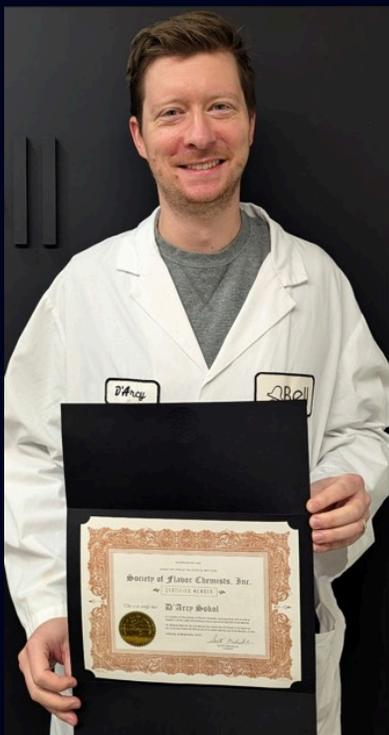
My name is Faith Foster, and I work in the sweet beverage group at Sensient Flavors. I graduated from UIUC with a bachelor's in chemistry and a minor in Food Science. I was first introduced to flavors when I started as a compounder at Sensient. The thing I enjoy the most about this field is that you get to use science and creativity to bring flavors to others. I have been able to grow and learn so much in my time as a trainee and I cannot wait to continue my journey! Outside of work I like to spend time with my friends and family, decorate cakes, and make baked goods.

**FAITH FOSTER**

Sensient

Apprentice

Sept 25, 2025



**D'ARCY SOKOL**

Bell Flavors & Fragrances

Direct to Certified

Sept 25, 2025

In 2015, I received my Bachelor's degree in Food Chemistry from McGill university and very shortly after fell serendipitously into the world of flavour. Having never worked in the food industry before, let alone in flavours, I suddenly found myself at a bench with thousands of ingredients at my fingertips, being asked to develop strawberries and oranges and vanillas out of thin air. I spent 7 years working as a flavorist at a small flavour house near Montreal, where I built experience not only in how to develop winning flavours but all of the other wheels that must turn to make any flavour house operate: production, quality control, regulatory, purchasing. I also learned various analytical techniques, being the sole operator of the chromatographic instruments, and was trained in the analysis -both organoleptic and instrumental- of essential oils of all kinds. It was during this time that I decided to pursue a Master's degree at McGill University, where I studied the impact of various storage conditions on flavour, elucidating the myriad reactions that can occur. Since 2022, I have worked as a flavorist for Bell Flavors & Fragrances where I have had the great honor of working with (and learning from...) some world-class flavorists, both in Montreal and in Chicago. .

I was born and raised in New Jersey and I hold a bachelors degree in Nutrition & Food Science from Montclair State University. I was first introduced to the flavor industry my senior year of college and I began formal training shortly after graduating in 2016. I successfully completed Symrise's Flavorist Training Academy in Germany and I currently work as a beverage flavorist for Symrise in Teterboro NJ.

**MICHAEL GOTERA**  
Symrise  
Upgraded to Certified  
Oct 16, 2025



With a background in analytical chemistry, I have always been fascinated by the varied and complicated chemicals found in nature and synthesized by humans. I'm lucky to have the opportunity to be trained as a flavorist, where I can blend my chemical analytical skills with creativity to make various flavors. This role has allowed me to study both the natural flavors and flavors created by others and create my own. The most rewarding moment in this job is when our customers approve my created or matched flavors, and those flavors bring them success. I also have a passion for new tech. And I am looking forward to utilizing those tools to make my job more exciting.

**YUHAO TIAN**  
Sensapure  
Apprentice  
Oct 16, 2025

# Committee News

## Volunteer Opportunities!

The Board Secretary position is open for nomination. If you would like to nominate a member or nominate yourself, please contact [chair@flavorchemist.org](mailto:chair@flavorchemist.org).

The Symposium Committee has an open Chairperson position. If interested, please contact [chair@flavorchemist.org](mailto:chair@flavorchemist.org)

We're looking to open a new committee called the IT Committee. For more information, please contact [secretary@flavorchemist.org](mailto:secretary@flavorchemist.org).

The Membership Committee is open for volunteers to join the committee. If interested, please contact [membership@flavorchemist.org](mailto:membership@flavorchemist.org)

If interested in joining any of the committees, please contact the committee Chair listed.



## COMMITTEES

### 2025-2026

#### ARRANGEMENTS

CHAIR: [Chris Williams](#)

#### AUDIT

CHAIR: [Paul Ricciardi](#)

#### BY-LAWS

CHAIR: [Mariano Gascon](#)

#### HISTORY

CHAIR: [Sharon Tortola](#)

#### LIBRARY

CHAIR: [Sam Tharpe](#)

#### MEDIA

CHAIR: [Alison Freedman](#)

#### MEMBERSHIP

CO-CHAIRS: [Aparna Oak](#)

[Ashley Rizzo](#)

[Jacqueline Finner](#)

#### PROGRAM-CHICAGO

CO-CHAIRS: [Greg Griffin &](#)

[Lauren Hammerschmidt](#)

#### PROGRAM-MIDWEST

CHAIR: [Katie Crowley](#)

#### PROGRAM-EAST COAST

CO-CHAIRS: [Kim Bendickson &](#)

[Tara Strober](#)

#### PROGRAM-WEST COAST

CHAIR: [Alex Scott](#)

#### NOMINATION

CHAIR: [Justin Kozlowski](#)

#### RECOGNITION

CHAIR: [Mary Robertson](#)

#### SCHOLARSHIP

CHAIR: [Katie Beaver](#)

#### SPONSORSHIP

CHAIR: [Alpa Roman](#)

#### SYMPOSIUM

CHAIR: OPEN

#### WEBSITE

CHAIR: [Elsa Howerth](#)



# History Committee

*As you know we are working on building a family tree of the flavor industry. This was an idea from Dolf DeRovira and Mike Bloom coming to fruition. If you have information regarding manufacturers, mergers, and acquisitions of flavor companies, please add them and dates to the spreadsheet. You can also add new flavor companies that have been created with their dates and owners.*

*Here is the link to the spreadsheet [Flavor MMA History Progress File](#).*

*Please email your updates directly to Dolf at [dolfd@flavordynamics.com](mailto:dolfd@flavordynamics.com).*

*The Flavor Industry Family Tree spreadsheet isn't just a record - it's a living history of the flavor industry and how it has changed over time. Once it is completed, it will be a valuable resource for not just SFC members but for anyone interested in the legacy and evolution of our industry.*

*Thank you for helping in this endeavor.*

Sharon Tortola  
SFC History Committee Chair  
[history@flavorchemist.org](mailto:history@flavorchemist.org)

# Membership Committee

At the April 10, 2025 business meeting, the membership committee co-chairs presented the Board-approved update to the testing protocol which appears on the Syllabus under SFC Candidate for Membership Interview Process, item #5.a. See this section below.

5. **The SFCMC shall determine if the candidate should be recommended for the level of membership to which the candidate had applied.**
  - a. For the written test:
    - i. Apprentice candidates shall be allowed no more than 20% incorrect or incomplete responses
    - ii. Certified candidates shall be allowed no more than 10% incorrect or incomplete responses
    - iii. If the number of incorrect responses exceeds the allowed percentage, the SFCMC reserves the right to not proceed to the verbal interview. Candidates who fail to pass the written exam will be notified by the Membership Chair of the “no pass” result.
  - b. Candidates recommended for membership shall be presented to the SFC membership for a vote at the first possible business meeting following the candidate’s interview
  - c. If the SFCMC recommends a “no pass”, the options shall be privately discussed with the candidate. The candidate’s name shall remain confidential
    - i. Should the candidate have already earned Apprentice membership, and is in good standing with the by-laws, they will retain the level of Apprentice until they either time out or upgrade successfully.



The Membership Committee is always looking to add new questions to the written tests and we appreciate suggestions from our members. Scan the QR code to submit a question of your own. You must be a Certified or Emeritus member to submit.

# Scholarship Committee

We offer two scholarships to students pursuing a degree in Food Science, Food Nutrition, Chemistry, or Biochemistry. Applications are being accepted now. If you would like to promote these scholarships at your college, please pass them on to your past professors or college contact.

## Dr. S. Dattu Sastry Scholarship

*Presented by*

**Jogue**  
Inc.

**\$2,000  
Scholarship  
Award**



THE SOCIETY OF  
FLAVOR CHEMISTS

The Society of Flavor Chemists, Inc. and Jogue Inc. believe in the power of education to transform the future of the flavor industry. Together they award the Dr. S. Dattu Sastry Scholarship, which aims to support those participating in research topics that will help guide the advancement of the food and flavor industry.

### Applicant Requirements:

- Currently pursuing a degree in Food Science, Chemistry, Biochemistry or Food Nutrition
- Statement of Interest in the flavor industry and long term career goals
- Commitment to Sensory Development: Passion to develop olfactory and taste skills
- Letter of recommendation from supervisor, instructor, mentor that is familiar with student's work in Food Science.

**APPLY NOW**



Visit Our Website

[flavorchemists.com](http://flavorchemists.com)

# Scholarship Committee

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THE SOCIETY OF  
FLAVOR CHEMISTS

## Scholarship Program 2026

**\$2,000  
Scholarship  
Award**

### About Us

The Society of Flavor Chemists, Inc. believes in the power of education to transform the future of the flavor industry. We award the Jaggard Scholarship, which aims to support those participating in research topics that will help guide the advancement of the food and flavor industry.

All students currently in a graduate degree program in one of the allied disciplines of the flavor industry (including, but not limited to, chemistry, biology, food science, nutrition, microbiology, engineering, business, or marketing) are eligible to apply. Get in touch with us and apply for our Scholarship Program.

**APPLY NOW**

**Visit Our Website**  
[flavorchemists.com](http://flavorchemists.com)



# Calendar

The following are the 2025-2026 SFC Meetings planned. Please be sure to book your hotel reservations and register for the meetings before the cut-off dates. See [SFC website calendar](#) for details and updates.

**September 25, 2025— Chicago Meeting in Schaumburg, IL**

**October 16, 2025— East Coast Meeting in Newark, NJ**

**November 6, 2025— CSA Chicago Roundtable in Chicago, IL**

**January 20, 2026— West Coast Meeting in Orange, CA**

**February 12, 2026— SFC/CSA/NAFFS East Coast Meeting in Atlanta, GA**

**March 3, 2026— SFC/CSA/NAFFS West Coast Roundtable in Anaheim, CA**

**April 16, 2026— Midwest Meeting in Loveland, OH**

**May 7, 2026— CSA Roundtable and SFC Annual Meeting & Awards Dinner in Newark, NJ**



*Editor's Note* If you would like to share an article, announcement, and /or message relevant to our members, and any questions, suggestions, or feedback, please contact Elsa Howerth at [elsa.howerth@kerry.com](mailto:elsa.howerth@kerry.com)