AChemS
Association for Chemoreception Sciences
ANNUAL Newsletter
2016
FOSTERING CHEMICAL SENSES RESEARCH AND UNDERSTANDING SMELL AND TASTE IN HEALTH AND DISEASE

MESSAGE FROM THE PRESIDENT

Susan Travers, PhD

Longer days, lighter skies, AChemS XXXVIII on the horizon — it must (nearly) be the vernal equinox! Even after an exceptionally mild winter, I look forward to returning to the bright beauty of Bonita Springs, and the opportunity to be immersed in chemosensory science once again. AChemS continues to be a vigorous society, with important discoveries being made at an accelerating pace. Thanks in part to the increasing participation of many of our members in social media, those discoveries seem to be more and more in the public eye. In fact, these days I find Twitter to be quite a good source for alerting me to findings in areas of the chemical senses that I don't follow closely, thanks to all of you "tweeters."

As always, it has been a busy year for AChemS officers and committee members.

Long-Range Planning Committee Outcomes

At last year's Annual Meeting, a Long Range Planning Committee (LRPC) insightfully organized by Past President, Debra Fadool, and co-chaired by Minghong Ma and Tim McClintock, met and formulated an "action plan" of specific recommendations. The plan was comprehensive and provided excellent, specific suggestions relevant to public information and affairs, the annual meeting, membership, finances, and industry and clinical relations. Needless to say, the list was rather daunting and so the Executive Committee began by prioritizing these suggestions and then acting on those that rose to the top. Several efforts are underway to carry out these suggestions and the LRPC will continue its work this year at the meeting.

One important goal was to foster the relationship of AChemS with federal and other agencies that are important sources of funding for our research. This necessitated making the goals of the Federal Liaison Committee clearer and recruiting additional members to carry out this mission. Alan Spector graciously agreed to join and chair the reinvigorated committee and Gary Beauchamp will complement the group. Along with existing members, Charlotte Mistretta, Barry Green, and Randy Reed, these individuals make up a strong team of senior scientists with diverse scientific interests. We owe a debt of gratitude to Barry Ache, the former chair of this committee, for his considerable efforts. The LRPC has already initiated efforts to invite more representatives of Federal Agencies to the meeting and it is our expectation that those efforts will begin to come to fruition for the 2017 meeting.

Another suggestion of the LRPC was to consider producing a yearly summary "white paper" for AChemS members to provide an update on links between the chemical senses, health and disease. Such a resource would be useful to many of us, not only in our teaching efforts and interactions with non-scientists, but for our own enhanced appreciation of the relevance of our work. Valerie Duffy, the chair of the clinical relations committee, and I have been developing plans for such an annual or biannual review highlighting recent findings of clinical interest. Wolfgang Meyerhof has agreed that *Chemical Senses* would be an appropriate venue with the expectation that the paper would be subject to the standard review process. We plan to meet at the Annual Meeting to solidify plans to accomplish this, with the hope that the first such article could be published in the January, 2017 issue of *Chemical Senses*.

NIH strategic plan

You may remember receiving emails from me last summer asking for your input to the NIH Strategic Plan, a plan that was requested by Congress. Many thanks to those of you who

continued on next page

communicated your opinions. Based on your input and that from the FLC, AChemS submitted a reply to this request for information. In December 2015 NIH "unveiled" this strategic plan, which looks ahead over the next four years. It makes for interesting reading—you can access it at the following link (NIH strategic plan). The plan is broad in scope, but I believe, quite congruent with the goals of AChemS members. It was heartening to see that the critical role of basic science in promoting health, preventing disease and in formulating treatments and cures was front and center. Likewise, the document makes a compelling case for strengthening the biomedical research workforce and a strong argument for enhancing resources to support research. We hope that Congress understands and acts on the wisdom of these arguments.

Annual Meeting

Julie Mennella, the Program Committee, and the Executive Office (our association management firm, L&L), have been hard at work planning an exciting meeting, which is now just under a month away (April 20-23). This endeavor requires a huge amount of talent, effort and coordination that we all stand to benefit from. Their efforts are wholeheartedly appreciated. We will be back at Bonita Springs for the third year and except for the US ISOT year in 2020, have signed a contract with the Hyatt through 2021. I expect that this venue will soon feel as much like home as Sarasota once did. However, that does not mean that we should not remain alert to alternatives for future meetings, as these must be scouted several years in advance. This year the Presidential Symposium will feature presentations highlighting the work of distinguished members of our society who are the recipients of the Max Mozell, Barry Jacobs Memorial, Ajinomoto, and AChemS Young Investigator Awards. I look forward to stimulating presentations by those scientists who represent a wide spectrum of the most excellent research in the chemical senses. I hope to see everyone there. Another new event at this year's meeting is an outgrowth of the Archives Committee. Charlotte Mistretta, the Chair of that committee, has organized a "journal club" which will celebrate the 75th (amazing!) anniversary of Carl Pfaffmann's classic paper, "Gustatory afferent impulses" which was published in the *Journal of Cellular and Comparative Physiology* in 1941 and was the first to describe taste responses from single chorda tympani neurons. These findings will be put in context of very recent efforts to probe the very same question with Ca++ imaging. This sounds like a huge amount of fun to me. And to make Bonita Springs feel even more like home, we look forward to a revival of the "Taste vs. Smell" softball game, organized by the indefatigable Debi Fadool. Go Gust!

In Conclusion

Finally, I want to express gratitude to the many individuals who volunteer their time to make the AChemS organization run smoothly. I first became acquainted with the large behind the scenes efforts when I was AChemS Secretary many years ago. Gone are the days when the Secretary used a tape recorder to take Executive Committee minutes and compiled the newsletter in "Word Perfect," but expectations have risen and the level of effort remains just as high. Even with our large number of volunteers we could not be the professional organization that we are without the efforts of our association management firm, L & L. Tisha Kehn has been with us for 12 years and provides great expertise and a much-needed corporate memory. We welcome a new member of the L & L team, Alexia Molion. The past year has gone very quickly and of course, I have not accomplished all that I had originally envisioned but I feel entirely confident in handing over Jim Smith's lovely gavel to Steve Munger. It has been a true pleasure and honor to serve as president of AChemS.

TREASURER'S REPORT

Joel Mainland, PhD

The financial state of AChemS is strong. A review by the independent auditors conducted in June 2015 revealed that AChemS' assets increased by approximately $3K compared to the previous year. Federal research funds have been tight for a number of years now, and AChemS has responded by keeping the registration fee very low. Our expenses have been growing at about 5% a year over the past 3 years, while revenue has been increasing by about 1%. To balance the budget we raised registration fees for the 2016 meeting. Note that even after the increase, our registration fees are still lower than most peer organizations (e.g., ISOT, ECRO, SSIB, and Obesity). UBS is now managing approximately $321K of AChemS assets. Since inception in December of 2011, the value of the portfolio has increased by approximately $24K.

PROGRAM CHAIR'S REPORT

Julie Mennella, PhD

The 38th Annual Meeting of the Association for Chemoreception Sciences will open at 5:00 pm Wednesday, April 20th at the Hyatt Regency Coconut Point in Bonita Springs, FL. This year's meeting highlights the breadth, diversity and quality of research in the chemical senses. While it contains many features of past years, you will find additions to the program, most notably the Presidential Award Symposium and Journal Club and the return of an old favorite: the Taste versus Smell softball game. To give you a flavor for this year's meeting, read on.

SPECIAL EVENTS

Givaudan Lecture: "The Human Oral Microbiome"
Wednesday, April 20, 2016
6:00 – 7:00 pm

This year's Givaudan lecturer is Dr. Ann Griffen, Professor in the College of Dentistry at Ohio State University. In addition to her active clinical practice in pediatric dentistry, Dr. Griffen is an accomplished researcher, funded through the National Institute of Dental and Craniofacial Research. She uses molecular approaches to study the acquisition of the human oral microbiome and the dysbiosis of periodontitis and dental caries. Recently, she has become interested in the role of sweet taste in children, and the implications for human oral microbial communities in the most prevalent chronic disease of childhood — diet-induced dental caries.

The AChemS Journal Club: "Historical Contexts for Current Chemosensory Research"
Friday, April 22, 2016
4:00 – 5:00 pm

The inaugural session from the AChemS Archives Committee will focus on "Studying the Peripheral Taste Neuron: Then and Now." To celebrate the 75th Anniversary of Carl Pfaffmann's paper (Gustatory afferent impulses, *Journal of Cellular and Comparative Physiology* 17(2): 243-258,1941) and coming to the present with discussion of current technical approaches to record from geniculate ganglion neurons. Papers that will be discussed include: 1) Barretto et al, "The neural representation of taste quality at the periphery," *Nature* 517:373-6, 2014; and 2) Wu et al, "Breadth of tuning in taste afferent neurons varies with stimulus strength," *Nature Communications* 6:8171, 2015.

How has the chemosensory field asked questions about, listened to, and analyzed single and ensemble peripheral taste neuron data over the past 75 years? Junior and senior members of the AChemS community will present and discuss the papers. All are encouraged to attend.

Moderators: Charlotte M. Mistretta, University of Michigan and David L. Hill, University of Virginia.

Presenting and summarizing papers: Rolf Skyberg, PhD Candidate, University of Virginia and John D. Boughter, PhD, University of Tennessee Health Science.

Special Lecture: "Sometimes You Feel It, Sometimes You Don't"
Saturday, April 23, 2016
4:00 – 5:00 pm

Master Perfumer Christophe Laudamiel will discuss the frontstage and backstage of olfactory art and the scientific effects explored — or perhaps to be explored — related to this discipline still in its infancy. In an interactive presentation, he will demonstrate what outside sniffers and viewers have a hard time exploring within the mysterious metier of a perfume composer, in addition to presenting concepts explored in his numerous installations around the world. Bring your nose and your brain — the rest of the materials will be provided!

SYMPOSIA

This year, we will have eleven symposia, including the Clinical Symposium which highlights the advances in the study of anosmia; the plenary Presidential Symposium featuring the 2016 winners of the Max Mozell, Barry Jacobs Memorial (Mind Genomics Associates), Ajinomoto, and AChemS Young Investigator Awards; the Industry Symposium on chemosensory model systems; the plenary Polak Young Investigator Symposium featuring our rising stars; six member-initiated symposia and two oral symposia consisting of abstracts selected by the Program Committee for scientific merit.

THURSDAY, APRIL 21

10:30 am – 12:30 pm
Symposium: Olfactory Dysfunction in Traumatic Brain Injury
Chair: Diego Restrepo
Akiva Cohen: **Excitatory/inhibitory synaptic imbalance and dietary therapy following traumatic brain injury**
James E. Schwob: **How to fix a broken nose: Olfactory stem cells and regeneration**
Bradley J. Goldstein: **Trauma-related olfactory deficits: an otolaryngology perspective**
Leonardo Belluscio: **Using the olfactory system to study traumatic brain injury**

Symposium: Deconstructing Food
Chair: Joel D. Mainland
Terry E. Acree: **From chemicals to odor images**
Thomas F. Hofmann: **Deciphering food odor and taste codes by means of a Sensomics approach**
Sebastian E. Ahnert: **The Flavour Network: an introduction to computational gastronomy**
Linda M. Bartoshuk: **Volatiles in fruits can enhance sweetness independently of sugars**

1:00 – 3:00 pm
Clinical Symposium:
Anosmia – the Patient, the Clinic, the Cure?
Co-Chairs: Sanne Boesveldt and Valerie Duffy
Duncan Boak: **The impact of olfactory disorders on quality of life and emotional wellbeing**
Antje Welge-Lüssen: **ENT perspective in sinonasal anosmia - diagnosis, treatment and prognosis**
John Ngai: **Illuminating cellular diversity and mechanisms of regeneration in the olfactory epithelium stem cell niche**
Jeffrey R. Martens: **Gene therapeutic strategies for congenital anosmias: translating basic science and pre-clinical work**

3:00 – 5:00 pm
Oral Session 1
Chair: Steven Munger
Erin E. Maher: **Taste pathways and tastant selectivity in tree shrews (Scandentia, Tupaia Belangeri)**
Tim McClintock: **Lhx2 determines odorant receptor expression frequency in mature olfactory sensory neurons**
Jessica H. Brann: **Odorant receptor expression is perturbed in mice following recovery from genetically-mediated lesions**
Cedric R. Uytingco: **Gene therapeutic restoration of olfactory cilia and odor detection in Bardet-Biedl syndrome**
Huey Hing: **Coordinated guidance of presynaptic and postsynaptic processes by Wnt5, Derailed/Ryk and Van Gogh in Drosophila melanogaster**
Linda A. Barlow: **β-catenin is required for taste bud homeostasis and maintenance of behavioral taste perception in adult mice**

Oral Session 2
Chair: Sue Kinnamon
Lynnette P. McCluskey: **Inhibition of neurophysiological and behavioral responses to sweet stimuli by gastrointestinal LPS**
Johanna L. Reichert: **The correspondence of the nasal microbiome and normal olfactory function**
Lindsey A. Czarnecki: **Multimodal responses in the olfactory bulb**
Larson D. Eric: **The effect of anesthetics on taste responses**
M. Yanina Pepino: **Sweet Dopamine: Striatal D2 receptor binding and age are associated differentially with sucrose preferences in obesity**
Ivan E. De Araujo: **Separate circuitries encode the gustatory and nutritional values of sugar**

FRIDAY, APRIL 22, 2016

10:30 am – 12:30 pm
Symposium: Chemosensory Processing in Amygdala Subnuclei: Substrates for Affective Decisions?
Chair: Michael Meredith
Joseph F. Bergan: **Sexually dimorphic encoding of social stimuli by the medial amygdala**
Lindsey M. Biggs: **A medial-amygdala/ intercalated-nucleus circuit for modulation of amygdala response to chemosensory signals and its subsequent output**
Matthieu Keller: **Biological olfactory processing in the amygdala and reproductive behavior: the sheep as a model**
Regina M. Sullivan: **Odors associated with infant trauma rescue depressive-like adult behavior via changes in amygdala**

Symposium: Structural Insights into Chemosensory Receptors
Chairs: Simone Weyand and Wolfgang Meyerhof
Guy Servant: **Allosteric modulators of the human sweet taste receptors**
Peihua Jiang: **Structure, function and genetics of the sweet taste receptor**
Joel D. Mainland: **Predicting human odor perception from olfactory receptor function**
Craig Montell: **Cellular and molecular basis for gustatory detection of food texture and toxins in Drosophila**

7:00 – 9:00 pm
Presidential Symposium
Chair: Susan Travers, President

This year's President's Symposium has a new twist. The Symposium will feature presentations from the four major society merit awardees. It is designed to showcase some of the most important work being done in the Chemosensory Sciences. Don't miss it!

John Hayes, Recipient of the Barry Jacobs Memorial Award for Research in the Psychophysics of Human Taste and Smell: **Using psychophysics to understand perception of real foods**
John McGann, Recipient of the AChemS Young Investigator Award for Research in Olfaction: **What is the olfactory bulb for?**
Stephen Wooding, Recipient of the Ajinomoto Award for Young Investigators in Gustation: **Bitter taste perception: Genes, toxins, and evolution**
Harriet Baker, Recipient of the Max Mozell Award for Outstanding Achievement in the Chemical Senses (Presented by John Cave): **A journey towards understanding molecular mechanisms underlying synaptic activity-dependent regulation of the olfactory bulb dopamine phenotype**

SATURDAY, APRIL 23, 2016

10:30 am – 12:30 pm
Platform Presentations: Polak Young Investigator Award Recipients
Chair: Linda Barlow

Thanks to the generous support of the Polak Family Foundation, this plenary session highlights the rising stars in chemical senses research.

Diego V. Bohórquez: **Transduction of a sense in the gut**
Laura B. Duvall: **NPY-like regulation of host-seeking suppression in Aedes aegypti mosquitoes**
Nandakumar Venkatesan: **Podoplanin (PDPN) plays important roles in the development of taste organs in mice**
Tao Huang: **Morphological diversity of taste nerve fibers in the mouse tongue**
Emilia Iannilli: **Effective connectivity of the insular gustatory cortex**
Veronika Schöpf: **The interaction effect of estradiol concentration and intake duration on olfactory performance levels in oral contraceptive users**

2:00 – 4:00 pm
Industry Symposium: Chemosensory Model Systems
Chair: Christopher T. Simons
Discussants: Wolfgang Meyerhof, Alan Spector, Punyatoya Mohapatra

Participants will explore and discuss the underlying science and limitations associated with common chemosensory models including cell-based high-throughput screening assays, animal behavioral models, and electrode-based systems including the electronic tongue or electronic nose chemosensory models. The structure of the workshop will enable dialogue between academic and industry researchers regarding these important techniques and to explore their effectiveness and convenience as it relates to industrial research needs. Workshop discussants and moderators include Wolfgang Meyerhof, PhD, Department of Molecular Genetics, German Institute of Human Nutrition Potsdam-Rehbruecke, who will introduce the topic of cell-based screening assays; Alan Spector, PhD, Department of Psychology, Florida State University, who will discuss the topic of animal behavioral models; and Punyatoya Mohapatra, PhD, AFB International who will lead the discussion on electrode-based systems including the electronic tongue and electronic nose.

PROGRAM CHAIR'S REPORT, *continued*

6:00 – 8:00 pm
Symposium: Predicting Olfactory Perception
Chair: Leslie B. Vosshall
Leslie B. Vosshall: **Toward a solution of the stimulus percept problem in olfaction**
Bharat Panwar: **Prediction of personalized olfaction response**
Richard C. Gerkin: **From shape to smell: Predicting odor descriptors from molecular features**
Pablo Meyer: **Personalized predictions of human olfaction: a community effort to accurately infer odor perception from molecular structures**

Symposium: A modern take on CNS gustatory processing: from primary nerve input to the driving of consumption decisions
Chair: Don Katz
Nirupa Chaudhari: **From taste buds to the hindbrain: In search of a Rosetta Stone**
Patricia M. Di Lorenzo: **Temporal coding of taste in the brainstem: What is it good for?**
Sam Reiter: **Spatiotemporal coding of individual chemicals by the gustatory system**
Paul Miller: **State transitions in gustatory cortex during taste processing: electophysiological evidence and computational models**

SOCIAL EVENTS

WEDNESDAY, APRIL 20, 2016

7:00 – 9:00 pm
AChemS Welcome Banquet
Join us for the traditional AChemS Welcome Banquet, the first opportunity to reconnect with colleagues and kick the meeting off right! Cash bar is available. The event will be held on the Waterfall Pool Deck (Inclement weather backup: Calusa Ballroom and Foyer).

9:00 pm
Graduate Student Happy Hour
A relaxed, casual gathering and opportunity to mingle with other graduate students over a cocktail! The patio of Mangroves will be the exclusive gathering spot for this event. Cash bar.

FRIDAY, APRIL 22, 2016

2:00 – 5:00 pm
Taste vs. Smell Softball Game
The tradition returns! Grab your glove and carpool over to the Hammond Stadium/Century Link Sports Complex (the advanced A Affiliate of the Minnesota Twins!) for a little friendly competition. No pre-registration is required; carpool sign up is available at Registration. Bats and balls will be provided. Be sure to bring water!

5:00 – 6:30 pm
AChemS Career Networking Social
This event is geared for all students and postdoctoral fellows to network and discuss topics important to young chemosensory scientists.

Words of Gratitude
I couldn't have done this without the dedication and help of the Program Committee. Special thanks to Dana Small, Linda Barlow, Susan Travers, Debi Fadool and the AChemS Executive Office staff.

MEMBERSHIP CHAIR'S REPORT

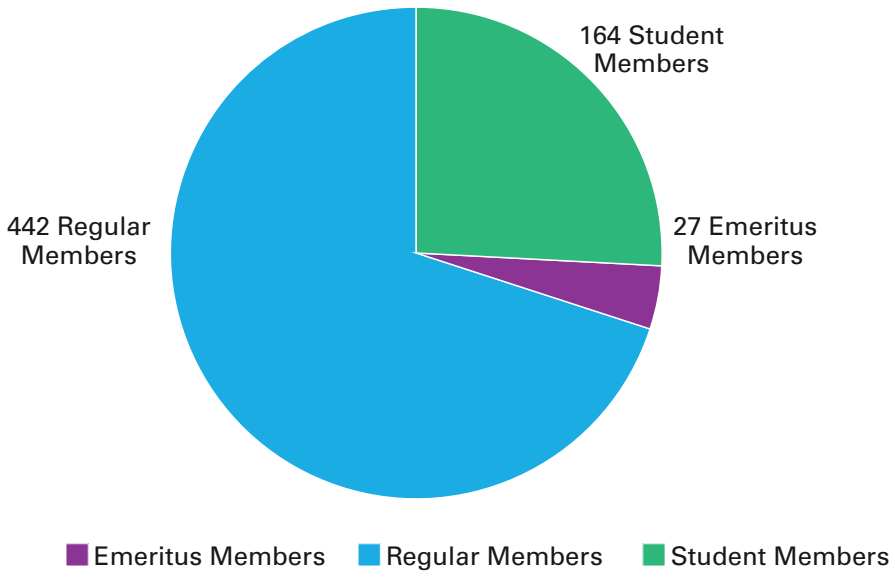
Pam Dalton, PhD

As of early April, 633 total members have renewed for FY2016, with numbers in each category remaining relatively stable from this time last year. Since the deadline for early meeting registration hadn't occurred as of this writing, we anticipate a slight increase in membership prior to the meeting, in line with previous years.

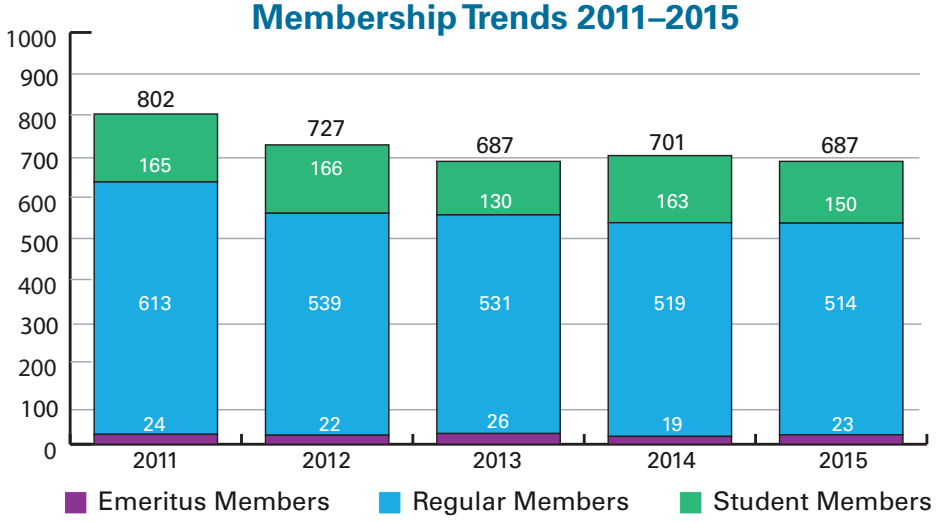
Each year, the number of non-renewing regular and student members remains relatively constant. Last year we implemented a more targeted outreach to encourage membership renewal among the pool of members who had been dropped from membership or were categorized as in arrears (had not renewed membership for 2 years). This effort is on-going. We are also exploring additional benefits to enhance the value of membership.

The member directory was updated to remove all individuals who were no longer current members. All of the directory information is synced automatically with the AChemS database, so when someone makes changes to their record, the directory will immediately reflect that change.

2016 YTD AChemS Membership



Membership Trends 2011–2015



COUNCILOR'S REPORT

Shawn Dotson, PhD, *Senior Councilor* and Theresa White, PhD, *Junior Councilor*

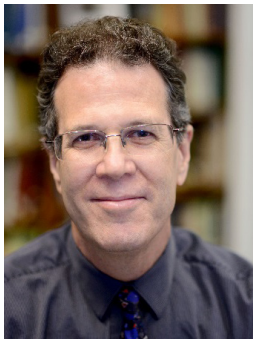
The association tries its best to continuously support the attendance of students and young scientists at our Annual Meeting. This year, AChemS will provide support to 36 domestic and international students through the Student Travel and Housing Awards. The Councilors have also selected five junior investigators to receive the Polak Postdoctoral Travel Award.

At last year's meeting, we were able to partner with the Imaginarium Science Center in Ft. Myers to develop and implement an outreach program designed to disseminate scientific information to the public regarding the importance of the chemical senses to health and overall quality of life. At last year's event, we offered exhibits, displays and demonstrations to the community, particularly school children, revealing the importance of smell, taste, and flavor in everyday life! AChemS members volunteered their time and expertise so that they could inspire the attendees with demonstrations illustrating topics such as the genetic variation in androstenone sensitivity, the different contributions of taste and smell to flavor perception and food, the influence of color on the perception of odors, and olfactory health and the hazards of household products.

While the event was open to the general public, we had the privilege to directly demonstrate for approximately 100 3rd and 4th graders from Franklin Park Elementary. This school is located approximately 2 miles from the Imaginarium and is in one of the most socio-economically challenged areas of Lee County, predominantly African-American. It has a 96% rate of free and reduced lunch, with a minority percentage of 97%. Franklin Park is also a Title 1 school, which means it receives additional funding as an underachieving and low socioeconomic school. We are thrilled that at the AChemS 38th Annual Meeting, we will be continuing our reinstituted educational outreach mission by partnership directly with Franklin Park Elementary!

This year, the event will be held at Franklin Park Elementary on Wednesday, April 20th. Five AChemS members (Eric Larson, Courtney Wilson, Suzanne Sollars, Olga Escanilla, Jordan Ross, and Cameron Ogg) have generously volunteered their time and expertise. Our members will be aweing and inspiring the students with demonstrations illustrating topics such as the composition and location of taste buds on our tongue, how differences in taste bud anatomy and physiology in other animals influence their perception of taste, as well as multisensory integration (i.e., flavor).

2015 ACHEMS *Awards Ceremony*



Robert Margolskee

Max Mozell Award Recipient

Research Program

For more than two decades my laboratory has sought to understand the molecular basis of taste transduction. Beginning with our molecular cloning of gustducin in 1992 and continuing with in vivo studies of gustducin knockout mice in 1996 we have deciphered multiple steps in the taste signaling pathways underlying responses to bitter, sweet and umami compounds. Most recently we identified T1r3-independent pathways that provide an alternative means for detecting the sweet taste of sugars. We have extended our studies of taste signaling proteins to understand their roles in extra-oral chemosensation: how taste receptors, gustducin and TrpM5 contribute to chemosensory responses in intestines, pancreas, airways and testis. Solitary chemosensory cells, brush cells, hormone-producing enteroendocrine cells and other "taste-like" cells in gut contribute importantly to physiological responses to nutrients.

Key Discoveries

- Discovery of gustducin, the first taste-expressed gene
- Identification in taste cells of transducin, Gγ13, TrpM5, T1r3
- Made gustducin null mice, the first knockout mouse model in the chemical senses
- Knockout models of transducin, TrpM5, Tas1r3
- Identified roles of gustducin and T1r3 in "taste" signaling in gut endocrine cells

Acknowledgements

I have many, many colleagues to thank for helping me along the way. My PhD advisor Daniel Nathans and my postdoc advisor Paul Berg for indoctrinating me in molecular biology. My "cousin" Frank Margolis and macher Sid Udenfriend for guiding me to gustducin at the now defunct but formerly great Roche Institute. Yuzo Ninomiya, Sue Kinnamon, Steve Roper, Tim Gilbertson, Tony Sclafani, John Glendinning for wonderful collaborations. Susan McLaughlin, Peter McKinnon, Luis Ruiz-Avila, Stas Kolesnikov, Gwen Wong, Kim Gannon, Liquan Huang, Marianna Max, Peihua Jiang and many more lab members for all the hard work. Gary Beauchamp, Joe Brand, Andrew Spielman, Sasha Bachmanov and so many others at Monell for starting me off in the taste field. To NIH for generous long-term support. And to Monell and all Monellians for providing the most wonderful place to work.

Anna Talaga

Don Tucker Award Recipient

Research Program

My thesis research has focused on examining the role of a novel protein, CFAP69, in the murine olfactory system. CFAP69 is a highly conserved protein enriched in olfactory sensory neuron (OSN) cilia. Using the electroolfactogram, I found that mice lacking CFAP69 displayed faster peripheral olfactory onset and offset kinetics, and display reduced adaptation to repeated stimuli. In single cell suction recordings, conducted by our collaborator Johannes Reisert, we found that OSNs lacking CFAP69 exhibit increased sensitivity and are also able to fire action potentials more faithfully to repeated stimuli. Surprisingly, I found that Cfap69 mutant mice perform poorly in more complex olfactory behavioral assays, even though they have better temporal resolution of olfactory signals. Therefore, the role of CFAP69 in the olfactory system is to slow down transduction kinetics, decrease sensitivity, and contribute to adaptation, all of which allows for a correct temporal resolution of olfactory signals to support olfactory behaviors. I am currently analyzing the phenotypes of Cfap69/OMP and Cfap69/Nckx4 double mutant mice and addressing how CFAP69 may be modulating signal transduction at the molecular level.

Acknowledgements

Thank you to the AChemS Awards Committee for honoring me with this prestigious award. I especially thank my thesis advisor, Dr. Haiqing Zhao, for continued support, encouragement and expertise. We are very grateful to our long time collaborator, Dr. Johannes Reisert, who contributed to this project in countless ways. Thank you to the members of the Zhao laboratory and the Hattar-Kuruvilla-Zhao mouse tri-lab for helpful discussions and advice, as well the NIH/NIDCD for financial support.

Greg Suh

Ajinomoto Award Recipient

Research Interests

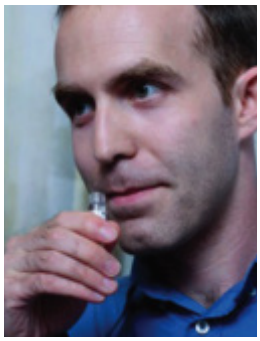
Sugars in the natural environment can be detected through taste-dependent and taste-independent modalities. Taste-dependent modalities consist mainly of peripheral chemosensory neurons such as sweet taste receptors, which primarily detect the orosensory value of sugar (i.e. sweetness). Evidence of a taste-independent modality — a post-ingestive sugar sensor — that detects the nutritional value of sugar has been shown in insects and mammals. However, the identity of the post-ingestive sugar sensor and the mechanism by which animals respond to the nutritional content of sugar independently of orosensory value is not clearly understood. My laboratory recently carried out an unbiased screen for neurons that are required for post-ingestive nutrient selection. From the screen, we identified six neurosecretory cells in the Drosophila brain that produce Diuretic hormone 44 (Dh44), a homologue of the mammalian corticotropin-releasing hormone (CRH), were activated by nutritive sugars that are present in the hemolymph and not by nonnutritive sugars. Dh44 neuronal cell bodies are located primarily in the pars intercerebralis, which is thought to analogous to the mammalian hypothalamus. They extend their dendrites to the dorsal region of the subesophageal ganglion zone (SEZ), and project their axons along the esophagus to innervate the gut. Flies in which the activity of these neurons or the expression of the Dh44 gene was disrupted failed to select nutritive sugars over nonnutritive ones after periods of starvation. Manipulation of the function of Dh44 receptors had a similar effect. Notably, artificial activation of Dh44 receptor-1 neurons dramatically increased the rate of proboscis extension reflex (PER) responses, promoting food intake. This manipulation also resulted in frequent episodes of gut contraction and excretion. Conversely, reduced Dh44 activity led to decreased excretion. Together, we propose that the Dh44 system directs the detection, ingestion (via increased PER), and digestion (via increased gut motility and excretion) of nutritive sugar through a positive feedback loop to continue consumption of nutritive sugar.

Acknowledgements

I would like to thank the Skirball Institute at NYU Langone Medical Center for providing me with generous support to launch this line of work, which has been new to my fledgling laboratory. We are especially indebted to invaluable advice from Ruth Lehmann, Moses Chao, Jessica Treisman and Wenbiao Gan, and stimulating discussions with Niels Ringstad, Don Ryoo, and Robert Froemke. My laboratory has been supported by the following grants: Alfred P. Sloan foundation, Whitehall foundation, the Klarman Family foundation for Eating disorder, the Whitehead Presidential award, the Hirschl/Weill-Caulier Trust award, Skirball Junior Faculty Collaboration award, NIDCD RO1, NIGMS RO1 grants.

References

1. Yarmolinsky, D.A., Zuker, C.S. & Ryba, N.J. Common sense about taste: from mammals to insects. Cell 139, 234-244 (2009).
2. Burke, C.J. & Waddell, S. Remembering nutrient quality of sugar in Drosophila. Current biology: CB 21, 746-750 (2011).
3. Fujita, M. & Tanimura, T. Drosophila evaluates and learns the nutritional value of sugars. Current biology: CB 21, 751-755 (2011).
4. Dus, M., Min, S., Keene, A.C., Lee, G.Y. & Suh, G.S. Taste-independent detection of the caloric content of sugar in Drosophila. Proceedings of the National Academy of Sciences of the United States of America 108, 11644-11649 (2011).
5. Sclafani, A. & Ackroff, K. Role of gut nutrient sensing in stimulating appetite and conditioning food preferences. American journal of physiology. Regulatory, integrative and comparative physiology 302, R1119-1133 (2012).
6. de Araujo, I. E. et al. Food reward in the absence of taste receptor signaling. Neuron 57, 930-941 (2008).



Joel Mainland

Mind Genomics Associate Recipient

Research Focus

A fundamental problem in neuroscience is mapping the physical properties of a stimulus to perceptual characteristics. In vision, wavelength translates into color; in audition, frequency translates into pitch. By contrast, the mapping from chemical structure to olfactory percept is unknown. In other words, there is not a scientist or perfumer in the world who can view a novel molecular structure and predict how it will smell. My laboratory's goal is to develop a predictive model relating molecular structure and olfactory perception using a combined psychophysical and molecular approach.

Acknowledgements

I would like to thank AChemS for being an integral part of my development as a scientist, the NIH for financial support, and the Monell Chemical Senses Center for providing a rich and supportive environment. Thanks to my mentors, collaborators, and colleagues who have trained and guided me, particularly Noam Sobel, Hiro Matsunami, and Leslie Vosshall.

Emre Yaksi

AChemS Young Investigator Award Recipient

Research Program

Dr. Emre Yaksi was born on March 13, 1978 in Turkey. He received his B.Sc. (2001) in Molecular Biology at Middle East Technical University, Ankara-Turkey. He obtained his PhD (2007) in the laboratory of Dr. Rainer Friedrich at Max Planck Institute for Medical Research, Heidelberg-Germany. He worked as a post-doctoral fellow (2007-2010) in Dr. Rachel Wilson's laboratory at Harvard Medical School, Boston, USA. He leads his research team at NERF since December 2010 and was appointed as an assistant professor at KU Leuven since October 2011. Since January 2015, Dr. Yaksi is an Associate Professor at Kavli Institute for Systems Neuroscience-Center for Neural Computation, Norwegian University of Science and Technology (NTNU) in Trondheim, Norway.

Research Summary

Our laboratory is mixture of enthusiastic life scientists, physicists and engineers, whose goal is to understand the fundamental principles underlying the function of brain circuits in health and disease. In order to achieve this aim, we use genetically tractable small model organisms, zebrafish and fruitflies. We monitor, dissect and perturb these tiny brains, through a combination of functional imaging, optogenetics, electrophysiological recordings, molecular genetics and quantitative behavioral assays.

Our primary goal is to understand how chemosensory world (smell and taste) is represented in the brain and how these computations regulate different behaviors (e.g. fear, arousal, feeding). Moreover, we are interested in understanding how these representations are modulated by behavioral states of animals (e.g, stress and hunger) or other senses (e.g. vision). We achieve this by focusing on those brain areas that integrate information from multiple sensory modalities and closely relate to behavior (e.g. habenula, brainstem). The small and accessible brains of zebrafish provide an exceptional framework for studying the neural circuit computations both locally and across multiple brain regions simultaneously.

Moreover, a small core in our laboratory is applying systems neuroscience tools for studying neural circuit function and architecture to study zebrafish and fruitfly models of neurological diseases. On the long term, we expect that our work on the neural computations will inspire scientists not only to simulate and imitate brain circuits in silico, but also comprehend neural mechanisms underlying neurological conditions such as stress, anxiety, eating disorders or neurodegenerative diseases and inspire the development of novel therapies.

Acknowledgements

I would like to thank AChemS for this prestigious award, which is a wonderful encouragement for me as an early career independent researcher. I would like to thank my colleague, Dr. Marc Spehr, for nominating me for this award. I would also like to thank my PhD and post-doc advisors, Dr. Rainer Friedrich and Dr. Rachel Wilson. Most of all I would like to thank all members of the Yaksi lab: Cameron Wyatt, Carmen Diaz Verdugo, Ewelina Bartoszek, Filip Janiak, Florence Kermen, Luis Franco Mendez, Maximillian Hoffmann, Nuria Vendrell Llopis, Stephanie Fore, Suresh Kumar Jetti, Robbrecht Pelgrims, for being such a wonderful team to work with. And finally, I would like to thank my wife Nathalie Jurisch-Yaksi for her endless support.

2016 AWARDS COMMITTEE REPORT

Steven D. Munger, PhD, *Chair*

The 2016 Awards Committee was charged with determining the recipients of five awards.

Candidates for the Don Tucker Memorial Award for Graduate Student Research will be considered at the Annual Meeting. The finalist candidates are indicated in the meeting program. I strongly encourage all meeting attendees to see the presentations of these talented junior scientists.

The Committee considered nominees for four awards for senior and mid-career investigators. The winners were:

The Max Mozell for Outstanding Achievement in the Chemical Senses: Harriet Baker, PhD, Emeritus Professor, Burke Rehabilitation Center, Brain and Mind Research Institute, and Weill Cornell Medical College.

The Ajinomoto Award for Young Investigators in Gustation: Stephen Wooding, PhD, Assistant Professor, University of California Merced.

The AChemS Young Investigator Award: John McGann, PhD, Associate Professor, Rutgers University.

The Barry Jacobs Memorial Award for Research in the Psychophysics of Human Taste and Smell: John Hayes, Penn State University.

These four individuals, as well as the winner of the 2015 Don Tucker Award, will be acknowledged during the opening ceremonies for the 2016 Annual Meeting. The winners of the Ajinomoto Award, the AChemS Young Investigator Award and the Barry Jacobs Memorial Award will present aspects of the work for which they are recognized during the Presidential Symposium. In that same symposium, Dr. John Cave will present a talk highlighting many of the accomplishments for which Dr. Baker is recognized with the Max Mozell Award.

The Awards Committee was composed of eleven AChemS members, ten of which serve staggered 3-year terms. The Committee is chaired by the President-Elect.

MENTORING/NETWORKING COMMITTEE REPORT

Robin Dando, PhD, *Chair*

Please join us at 5:00 – 6:30 on Friday evening, April 22 for the Career Networking Social, on the Estero Terrace and Royal Palm Courtyard.

Has it been a year already? This year's networking social will take place in the same spot as last year, on the Estero Terrace and Royal Palm Courtyard, but this year we'll have some respite from the unforgiving Florida sun, last year people were looking a little woozy. This year, we're promised an "inside/outside" event, with air conditioning for those who'd like it. We've also arranged it so there won't be any other events happening alongside the event, so there'll be plenty of time to come down, grab some food and drink, and network with others in your area (or not in your area). This year's topic tables will include the all new post doc speed dating! If you're a graduate student or post doc looking for the next position, or a PI with a job opening to fill, come down and chat with some potential connections. As well as this, we'll cover topics such as careers in industry, working outside the USA, careers in science for minorities, and women in science.

We'll also be having the graduate student happy hour at the Mangroves Patio (cash bar), on Wednesday, April 20 at 9:00 pm, right after the Welcome Banquet, so please come down and start the meeting off networking with fellow students. As usual, if you have any suggestions for the next meeting, don't hesitate to contact us, the Mentoring/Networking Committee (**info@achems.org**). We'll see you in Florida.

CHEMICAL SENSES REPORT

Wolfgang Meyerhof, *Editor-in-Chief*

	2008	2009	2010	2011	2012	2013	2014	2015
Impact factor	3.041	3.031	2.327	2.599	3.222	3.278	3.157	?
Original submissions	145	194	218	161	147	141	163	175*~#
Avg. time from submission to 1st decision	31.32 days	27.43 days	27.62 days	29 days	35 days	33 days	34 days	34+ days
Avg. time from submission to final decision	81.57 days	69.57 days	70.3 days	100 days	95 days	82 days	75 days	86+ days
Accepted articles	73	74	96	77	62	65	64	72
Accept ratio	**51.77%**	**46.54%**	**46.15%**	**48%**	**42%**	**46%**	**42%**	**43%**

**166 original articles, 7 review articles, 2 commentaries*
#No. of submissions: Unites States > Germany = Japan > China > UK > France > Australia = Spain > Sweden = Italy > 27 other countries; + time required by authors to prepare revisions not included.
Submission rate appears constant.
Editorial board rearranged: Executive Editors: Alexander Steinbrecht left, Johann Lundström joined the team.

CLINICAL RELATIONS COMMITTEE REPORT

Valerie Duffy, PhD, *Chair*

Clinical Lecture: Anosmia – the patient, the clinic, the cure?

Few people appreciate the range of information provided by the sense of smell, while it forms a major part of many of life's pleasurable experiences, whether eating a meal, a walk in the countryside, or intimacy with one's partner. Hence, losing the sense of smell – anosmia —can have a severe impact on the lives of those who suffer from it. Currently, there are limited treatments or cures available. Recently, there is growing research interest on managing and treating olfactory dysfunction. Thus, the Clinical Relations Committee (Valerie Duffy, Pamela Dalton, and Don Leopold) is proud to offer all AChemS meeting attendees a multi-disciplinary Clinical Lecture this year. Organized by Sanne Boesveldt, Wageningen University, four speakers from different backgrounds — scientists, physicians, and patient (organizations) — will provide different viewpoints on anosmia: not only a clinical perspective in humans, but also focusing on recent advances in fundamental science, in animal, cellular or genetic models. Following a brief introduction by Dr. Boesveldt, Dr. Antje Welge-Luessen, University Hospital Basel, will give an overview of current knowledge and status regarding diagnostics and prognosis in the ENT clinic. Next, Duncan Boak, Fifth Sense founder, will discuss how anosmia affects patient's quality of life, and present and discuss recent exciting developments in fundamental research with the aim of treating certain anosmias (e.g., olfactory epithelial stem cell regeneration), by John Ngai, University of California, Berkeley; and gene therapeutic approaches to restore olfactory loss, by Jeffrey Martens, University of Florida.

INDUSTRY LIAISON COMMITTEE REPORT

Chris Simon, PhD, *Chair*

The Industrial Liaison Committee (ILC) would like to welcome new members Meera Vinjamuri (Monell Chemical Senses Institute) and Bernadette Cortese (Medical University of South Carolina). Special thanks to Rachel Herz for her extended service to this committee over numerous prior years.

The ILC has worked hard to deliver another interesting Industry Workshop at the upcoming AChemS Annual Meeting. This year's workshop, entitled Chemosensory Model Systems, will be held on Saturday, April 23 from 2:00 – 4:00 pm. The workshop will encourage dialogue between scientists as we explore common models of human chemosensory function used by industry and academia. Workshop discussants and moderators include Wolfgang Meyerhof, PhD, Department of Molecular Genetics, German Institute of Human Nutrition Potsdam-Rehbruecke, who will introduce the topic of cell-based screening assays; Alan Spector, PhD, Department of Psychology, Florida State University, who will discuss the topic of animal behavioral models; and Punyatoya Mohapatra, PhD, AFB International who will lead a discussion on electrode-based systems including the electronic tongue and electronic nose. Please make sure you plan your schedule so you can attend this exciting and informative event!

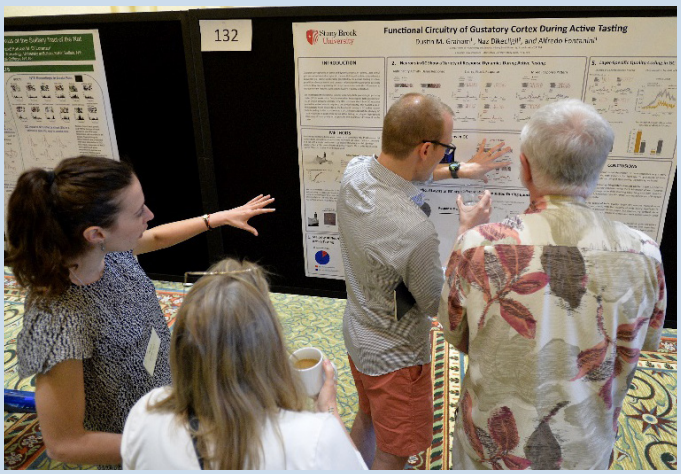
The ILC has just completed the annual AChemS Sponsorship Campaign. The sponsorship campaign enables AChemS to maintain the excellent quality of the Annual Meeting. Contributions also help to support the Don Tucker Memorial Award for Graduate Student Research, graduate student Travel and Housing Awards, and the Mentoring/Networking Social, a traditional networking opportunity for the mentors and mentees paired through the Mentoring Program. We would like to sincerely thank our continuing sponsors—PepsiCo, Givaudan Flavors, International Flavors and Fragrances and Kao. We would also like to welcome and thank our newest sponsor Kerry Taste and Nutrition. Finally, we thank our award sponsors, Ajinomoto and Mind Genomics, whose generous donations enable the presentation of the Award for Young Investigators in Gustation and the Barry Jacobs Memorial Award, respectively.

We are always looking for new sponsors and will work with your company to find a sponsorship level that works for you! For those companies considering AChemS sponsorship opportunities in the future, keep in mind that Sponsors have the opportunity to sponsor a named symposium; exhibit at a recruitment/tradeshow booth; host a "Breakfast with Industry" table; receive complimentary meeting registration and much more! If this sounds like an opportunity your company is interested in, we look forward to hearing from you!

AChemS
Association for Chemoreception Sciences

2015 Annual Meeting

Hyatt Regency • Bonita Springs, FL



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