UMass food scientists garner a mélange of sweet victories

Distinguished Professor David Julian McClements and Professor Hang Xiao, both among the most highly-cited researchers in the world, have won awards for their contributions to food science from the Institute of Food Technologists.

McClements was chosen to receive the Nicolas Appert Award, named after the French inventor known as the “father of canning.” The award honors “preeminence in and contributions to the field of food technology,” and recognizes a lifetime of achievement.

“I am really honored to receive this award from my peers in the food science community,” Julian says. “I have been extremely lucky to have wonderful colleagues, students and visiting scientists throughout my career at UMass, and to work in a department that fosters collaboration and innovation, which really helped me to establish a successful research program.”

Xiao was tapped for the Babcock-Hart Award, named after groundbreaking agricultural chemists at the University of Wisconsin-Madison. The award is given for food technology contributions that improved public health through nutrition. Hang says “it’s a great honor” to receive the award and recognition of his work from his peers, adding that he is very grateful for the support from his UMass Amherst food science colleagues that is critical to his research achievements.

Full story: umass.science/sweet

Attendees at the UMass IFT reception in New Orleans. The reception was sponsored by D&S Ingredient Solutions (thanks David Coles), Kerry (thanks Otis Curtis) and Star Kay White (thanks Steve Platt).
Alissa Nolden joins UMass Food Science

First sensory scientist since Miles Sawyer

Nolden is a sensory scientist exploring several different topics related to factors associated with individual differences in sensory perception. Understanding differences in taste will have a broad impact on multiple disciplines, such as taste disorders, food choice, metabolic syndrome, and taste biology. One priority of her current research is to improve the assessment of taste disorders in chemotherapy patients to first better profile taste loss with the long-term goal of identifying risk factors associated with taste loss and thus poor nutrition. This work will help in developing novel food products that better align with the sensory capabilities and also nutritional needs of cancer patients. A second area of interest is increasing vegetable consumption, with or without reduction in red meat intake. Adopting new dietary habits can be challenging, but is important for a healthy diet and for sustainability. Current projects are aimed at identifying factors associated, such as demographic, environmental consciousness, and marketing statements that are associated with adopting new food habits, specifically increasing consumption of vegetables or alternative proteins. Identifying consumer characteristics will lead to better understanding of important drivers of dietary modification and improvements in formulation and marketing of healthful food products. A third area of research is the interaction between dietary exposure and taste sensitivity, with primary interest in receptor biology, including receptor expression and human taste genetics.

Food Science alumnus Noel Anderson new IFT President-Elect

Noel Anderson has been elected president-elect of the Institute of Food Technologists (IFT), an 80-year-old professional organization whose mission is to advance the science of food and its application across the global food system. Anderson’s term will begin in September. Anderson received his bachelor’s, master’s and Ph.D. degrees in food science and has remained engaged with the university throughout his career. He served on the Food Science Industrial Advisory Board for more than 20 years and received the Alumni Association’s Distinguished Service Award in 2011. After spending more than 35 years in research and development, first at General Foods/Kraft and most recently PepsiCo, Anderson is now managing partner of Mosaic Food Advisors, which helps food and beverage start-up companies. Anderson has been an active member of IFT for 45 years and was elected an IFT Fellow in 2010.

Xiao Receives NIH Grant to Explore the Role of Citrus Peel in Reducing Gut Inflammation

Hang Xiao received a $1.5 million grant from the National Institutes of Health (NIH) to study how substances produced in the gut from citrus compounds are involved in decreasing inflammation in the colon. The ultimate goal of his research is to develop diet-based strategies to prevent and treat inflammation in the colon and associated diseases, such as irritable bowel disease and colorectal cancer. Xiao studies compounds known as polymethoxyflavones, a unique class of flavonoids found almost exclusively in citrus fruits, such as lemons and oranges, especially in the peels. Hang says he hopes to show how humans can derive robust health benefits from consuming citrus products. Using orange peel or zest in recipes is a good start, but it may be that supplements containing higher concentrations of citrus polymethoxyflavones will offer the stronger punch.

“It’s critical to study how the bacteria in the gut help transform dietary compounds into powerful anti-inflammatory agents in our body,” says Xiao. “Once those anti-inflammatory metabolites are generated in the colon, they may fight off inflammation in the colon and related diseases, such as colon cancer.”

In Xiao’s research, mice are fed citrus polymethoxyflavones. The gut bacteria were found to be responsible for the production of an array of colonic metabolites from polymethoxyflavones, “and many of these metabolites possessed much stronger anti-inflammatory effects than their parental polymethoxyflavones,” Xiao says.
Coming to Your Household Soon: 3-D Food Printers, Nano Foods and Bug Burgers

David Julian McClements has written a new book that explores the brave new world of science and food. For the first time, the acclaimed researcher and academic author has geared a book about food science toward a general audience, encouraged by his teenage daughter. “There are so many exciting things going on in the food science area,” McClements says. “We’re in the midst of an unprecedented era of rapid scientific and technological advances that are transforming the way our foods are produced and consumed.”

In “Future Foods: How Modern Science Is Transforming the Way We Eat”, McClements explores an array of science-mets-food questions, such as: What is food architecture? It’s the use of architectural and design principles to construct healthier, tastier and more sustainable foods. Should nanotechnology and gene editing be used to enhance our foods? The book discusses efforts to create functional foods, which are fortified with nutraceuticals or probiotics to address malnutrition in developing countries and combat chronic disease, such as cancer, diabetes and obesity. While he stresses the need for consuming more fruits, vegetables and other fresh foods, McClements points out that this is not “practical” for everybody on Earth. “What we really need are processed foods that are affordable and convenient but also healthy and tasty,” McClements writes.

Full story: umass.science/futurefoods

Gibbons Reveals New Genomic Roots of Ecological Adaptation in Polar Bear Evolution

Scientists from the University of Massachusetts Amherst, Vanderbilt University and Clark University have shed new light on the genomic foundation of the polar bear’s ecological adaption by pinpointing rapid changes in the bear’s gene copy numbers in response to a diet shifting from vegetation to meat. In a paper published and chosen for the cover of the Proceedings of the National Academy of Sciences John G. Gibbons and Ph.D. student Shu Zhao of UMass Amherst, David C. Rinker of Vanderbilt and Natalya K. Specian of Clark discuss the first population-level study to characterize genome-wide patterns of copy number variation (CNV) in the polar bear and brown bear.
CNV refers to differences among individuals in the number of copies of a particular portion of the genome, and the study’s results suggest this variation played an important role in the adaptation of polar bears to the Arctic. The polar bear has evolved unique traits to adapt to the Arctic climate and ecology, such as a camouflaging coat of pigment-free fur. Brown bears are omnivores, primarily consuming vegetation, while polar bears evolved quickly to a fully carnivorous diet, eating seals and other animals.

Gibbons points to two of the interesting findings. Of the genes annotated as olfactory receptors, 88 percent had lower copy numbers in polar bears. He explains, “First, there is less to smell in the Arctic. The polar bears mainly have to hone in on two things – seals and mates. They aren’t looking for berries, grasses, herbs, roots and bulbs, like the brown bear.” Polar bears also were found to possess fewer copies of the gene that encodes salivary amylase, the enzyme that jump-starts the digestion of starch. “Human populations with a high-starch diet have more copies of this gene in their genome than human populations with a lower-starch diet,” Gibbons says. “We found the same thing with bears. “Our next step is to look at two different human populations to see if we see similar differences in copy number variants.”

Full story: umass.science/polarbear

Student Awards

Once again, UMass Food Science students have made us proud by receiving awards from numerous scientific societies across multiple disciplines. Congratulations to these hard-working students.

**New England Research Chefs Association**  
Amadeus Driando Ahnan

**Institute of Food Technologists**  
*Feeding Tomorrow Scholarship*  
Amadeus Driando Ahnan  
Liv Dedon  
Janam Pandya

**Food Microbiology Division Award**  
Christina Wormald

**Finalist of IFT Undergraduate Research Competition**  
Xiaoyan Tan

**Northeast Institute of Food**  
Amadeus Driando Ahnan  
Louis Colaruotolo  
Christina Wormald

**Phi Tau Sigma**  
Amadeus Driando Ahnan  
Ruojie Zhang

**Food Marketing Institute**  
Amadeus Driando Ahnan

**American Assoc. for the Advancement of Science**  
Louis Colaruotolo

**American Society for Nutrition**  
*Emerging Leaders in Nutrition Science Poster Competition*  
1st Place: Yanhui Han  
Finalist: Renalison Farias-Pereira

**American Oil Chemist Society**  
*Edible Applications Technology Student Award*  
Bingjing Zheng

**Lipid Processing and Biotechnology Award**  
Ruojie Zhang

**AACS Health and Nutrition Division Student Award**  
Weicang Wang

**Honored Student Award**  
Weicang Wang

**More Awards**  
*Best poster award, Pioneer Valley Microbiology Symposium*  
Korin Albert

**Outstanding Students Abroad Award**  
Weipeng Qi

**Consulate General of the People's Republic of China**  
Weipeng Qi
Faculty News

**Eric Decker** was elected President of the American Oil Chemist Society and was appointed to the National Academy of Science’s Food Forum.

**John Gibbons** gave an invited talk at the European Society of Evolutionary Biology meeting in Turku Finland on his work on fungi in fermented food.

**Lili He** gave talks in the BASF innovation event, Connecticut Department of Health, ACS conference, and TechConnect World Innovation conference. She also received the Tanner Award from IFT for the most-cited paper published in the Journal of Food Science's Toxicology and Chemical Food Safety section in 2016.

**Amanda Kinchla** presented her outreach efforts that aim at increasing interest in STEM fields with youth at IFT and she gave a talk at the International Association of Food Protection Annual Meeting held in Louisville, KY that shared her work related to postharvest wash water treatments to improve food safety.

**Julian McClements** gave keynote talks at the Gums and Stabilizers for the Food Industry Conference in San Sebastian, Spain; The International Colloids Conference in Sitges, Spain and the Delivery of Functionality in Complex Food Systems Conference in Porto, Portugal.

**Lynne McLandsborough** attended the 2019 HERS Institute where each participant undertakes Capstone and Signature Work, a leadership project designed by the participant which captures the unique needs of her campus, along with the participant’s leadership strengths. The curriculum covered many aspects of how to successfully lead a change initiative: general leadership principles, higher education trends, change management, budgets and financial statements, career planning, legal issues, equity, strategic enrollment management, talent management, and fundraising.

**Matt Moore** was appointed to the Journal of Food Protection Editorial Board and the IUFoST Finance and Food Safety committees. Matt also gave an invited lecture for the USDA Eastern Regional Research Center.

**Alissa Nolden** was chosen for the IFT Emerging Leader Network and she attended the Pangborn Sensory Science Symposium.
Yeonhwa Park has kindly agreed to lead our graduate program committee upon the retirement of Ron Labbe. She also gave an invited presentation at American Oil Chemist Society meeting and a talk at the American Chemical Society Meeting.

Hang Xiao gave invited talks at the Berry Health Benefits Symposium in Portland, OR; the NIFA Nanotechnology Grantees meeting in Nashville, TN the Nanotech Conference & Expo (Boston, MA) and the American Society of Pharmacognosy Annual Meeting.

David Sela was promoted to Associate Professor with tenure. David was the chair of the FASEB Science Research Conference on, “The Origins and Benefits of Biologically Active Components in Human Milk” and he co-organized the American Society for Nutrition (ASN) presidential symposium “You Are What Your Microbes Eat”. He also participated in an invitation-only meeting to advocate for microbiome funding from the U.S. federal government for ASN.

Guodong Zhang was promoted to Associate Professor with tenure. He also received the American Oil Chemists’ Society Young Scientist Award.

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The Food Science Student Leadership Fund, a $750,000 endowment, aims to provide more early research experiences and product development opportunities—from finance to entrepreneurship.

Please join your peers (who have pledged some $600,000) to help prep future Food Science students.

HELP US GROW

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