University of Massachusetts
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Alumni Scholarships

I want to start off by thanking everyone for their continued support of scholarships for our undergraduate and graduate students. This year we gave out the most scholarships ever including: 11 Alumni, 8 Buttrick, 3 Jack Francis, 3 Herbert Hultin and 1 Charlie and Mickey Feldberg Scholarship. In addition, we presented 5 Graduate Fellowships including the Peter Salmon and Stanley Charm Fellowships. Scholarships and fellowships totaled over $58,000. These scholarships are extremely important to our students to help with the ever increasing costs of college as well as to help the students build their resumes with these outstanding achievements. An often overlooked benefit of the scholarships is that the students can use our Departmental awards to help them secure additional scholarships. For example, students received over $20,000 in IFT Scholarships alone.

Thanks very much for your generous contributions,

Eric Decker

UMass Cherry Bomb Ice Cream Goes Retail

I hope you all enjoyed the UMass Alumni Magazine that highlighted our outstanding ice cream competition led by **Sam Nugen** and **Amanda Kinchla**. We are very excited to announce that Maple Valley Creamery has released the award winning "Cherry Bomb" Ice Cream to retail markets. Many thanks to Maple Valley who will donate half of the profits to sponsor future food science product development teams.

Julian McClements Wins National Award, 3 Fellowships

By Janet Lathrop

David Julian McClements, professor of food science at the University of Massachusetts Amherst and an internationally recognized expert in the encapsulation and delivery of bioactive components, recently was honored with the Institute of Food Technologies (IFT) Babcock-Hart Award for contributions to food technology that result in improved public health through nutrition. He also was elected a fellow of IFT, the U.K.'s Royal Society of Chemistry and the American Chemical Society.

McClements says, "It's really nice to be recognized by your colleagues for the work that you do. I love the research. I look forward to coming in every day. We have some fantastic new professors so I am learning something new all the time. My father was a truck driver and didn't like going to work, so I know I am very lucky to enjoy this so much." The UMass Amherst food scientist has established an internationally recognized research program in food biopolymers, colloids, nanotechnology and functional foods and has made "major contributions to food science throughout his career," says Eric Decker, head of the food science department at UMass Amherst. Food encapsulation for nutraceuticals boosts nutrition by adding compounds with health benefits to food, such as carotenoids, omega-3 fatty acids and vitamins A, D and E.

Using new structural design approaches, McClements recently developed practical new strategies to create reduced-calorie foods that taste and feel in the mouth like higher-fat foods, Decker explains. In particular, his research group has focused on understanding the impact of food composition and structural organization on the appearance, texture, shelf life and sensory attributes of food products. He has worked closely with food scientists in industry to develop strategies that are both effective and commercially viable, and a number of his approaches have been adopted in commercial food products. McClements is also a pioneer in applying physical chemistry principles to understand physicochemical and physiological processes in the gastrointestinal tract during digestion and absorption and has used this knowledge to increase nutrient bioavailability, induce satiety or control delivery.

Nano emulsions, solid lipid nanoparticles, protein nanoparticles, multilayer emulsions and microgels designed by McClements can be made entirely from food-grade ingredients using simple processing operations, making them suitable for commercial applications. This work is particularly important because many beneficial food ingredients recently shown to have high bioactivity are difficult to incorporate into food, but McClements' research accomplishments overcome several problems.

McClements has mentored more than 30 graduate students, 16 postdoctoral researchers, 18 exchange students and many undergraduates. He has written four books and edited six more, published more than 600 refereed manuscripts in scientific journals, more than 45 book chapters and more than 150 abstracts in conference proceedings. He currently is one of the most cited authors in the agricultural sciences, with an H-index of 70.

U.S. Rep. Jim McGovern Announces $1.7 Million in USDA Food Safety and Fresh, Local Food Grants to UMass Amherst Scientists

Congressman Jim McGovern today announced U.S. Department of Agriculture grants totaling $1.7 million to two University of Massachusetts Amherst food science researchers and the director of the ethnic crops program at the university's Stockbridge School of Agriculture. The grants will support food safety research and work with farmers to grow and sell more local, fresh ethnic crops popular with immigrant communities.

"UMass Amherst has come a long way since its founding as the Massachusetts Agricultural College," said McGovern. "While it has stayed true to its agricultural roots, today UMass Amherst boasts some of the best and brightest scientific minds in the Commonwealth. These federal funds will help these researchers increase food safety and expand access to fresh, local, healthy food to those who need it most."

UMass Amherst Chancellor Subbaswamy said, "As a land grant university with a rich agricultural history, we are committed to research and outreach that provides the citizens of Massachusetts and the nation with safe and nutritious food. We appreciate all that Congressman McGovern does in Washington to support federal investments in such a critical area." This major investment in agriculture includes:

Two grants, totaling $939,000 from the USDA's National Institute for Food and Agriculture (NIFA), to analytical chemist **Lili He** in the Food Science department, first to develop faster, more precise methods of detecting food-borne pathogens such as *Salmonella* and *Listeria*, and second to detect silver nanoparticles that may be present as pesticide residue in the food supply. Each of He's three-year research projects takes advantage of her special expertise in a technique called surface-enhanced Raman spectroscopy (SERS), which can detect samples as small as single molecules. Her research will not only reduce health risks of food-borne pathogens, but should improve the long-range sustainability of U.S. agriculture and food systems by reducing economic loss due to product recalls, she notes.

A NIFA grant of $499,977 to Assistant Professor **Julie Goddard** to further develop a new approach to "active food packaging," where the active agent stays in the package to prevent microbial growth, and inhibit spoilage and does not migrate into the food. Active packaging in use at present allows companies to use fewer food additives, as consumers are demanding, but some packaging additives end up in food, Goddard explains. Advanced packaging technologies she and colleagues develop will improve shelf life with fewer additives and therefore economic and environmental sustainability of packaged foods.

Amanda Kinchla Receives Grant to Work with Small Farms and Growers on Food Safety

By Janet Lathrop: The U.S. Department of Agriculture (USDA) recently awarded a five-year, $241,000 grant to a team of food science researchers at the University of Massachusetts Amherst to create a graduate training program that will combine laboratory research and practical application to help producers and processors improve the safety of fresh produce in the food supply.

Amanda Kinchla, extension assistant professor of food science, will lead the advanced training project funded by the USDA National Institute of Food and Agriculture's (NIFA) National Needs Graduate Fellowship Grant Program, which is intended to train "the next generation of policy makers, researchers and educators in the food and agricultural sciences."

As she explains, the Centers for Disease Control report that fresh produce is the leading cause of food-borne illness, and the Food and Drug Administration has begun to adopt new rules to address this by shifting its focus, from responding to contamination to preventing it, as called for in the Food Safety Modernization Act (FSMA) of 2011.

"This is the first time that there has been a food regulation specific for produce," Kinchla notes, "and there are challenges to implementing some of the proposed FSMA regulations. The demand for improved food safety continues to increase, making it the most significant change in a long time for the produce industry." With this program, we will train two masters and two doctoral student fellows who will do the laboratory research and extension projects that collaborate directly with growers and processors on feasibility and implementation. We hope to offer tested, validated methods that satisfy new food safety requirements as they come along, to help farmers and growers reduce food safety risks in an affordable but science-based way."

Congressman Jim McGovern saluted UMass Amherst as "a leader in food science research," and adds, "This award will help them to continue this work. Investing in this new graduate training program will expand academic opportunities for students, support local farmers and growers and ensure Massachusetts families continue to have access to the safest and freshest foods. I am grateful to the USDA for recognizing the excellent research UMass Amherst is leading and look forward to seeing this program grow."

Kinchla and food science researchers Julie Goddard, Sam Nugen and David Sela will develop a challenging curriculum that integrates research, coursework and food science extension experience, she says. Another goal is to recruit and retain high-potential students from underrepresented populations into the new curriculum. The NIFA fellows will learn sophisticated laboratory techniques in such areas as microbial ecology, researching and developing new contaminant detection sensors, improving sanitation through surface modification and other food safety research that will improve practices relevant to the produce industry.

Kinchla says, "One of the things we want to study is the relationship of food-borne pathogens to soil amendments such as raw manure, which has a high risk of containing *Salmonella*, *E. coli* and *Listeria*." She adds, "Produce safety is challenging as not all produce use the same processes. For example, what might be a good sanitizer dosage lettuce may not be the same as for tomatoes, thus preventing standardized practices for all produce." The fellows will test best practices of post-harvest food handing to reduce risks while also containing cost, she notes. Kinchla hopes the fellows will partner with produce growers and others in the real world to address real problems and build a bridge between research and application.

Goddard Recognized for Research by Institute of Food Technologists

Assistant professor of food science **Julie Goddard** recently won the Institute of Food Technologists' (IFT) 2015 Samuel Cate Prescott Award for "outstanding ability of research in food technology." The award is given to outstanding young researchers under 36 years old or who earned their highest degree within the past 10 years. Her expertise is in developing solutions at the intersection of food science and materials science to improve the safety, quality and sustainability of the food supply.

"In my lab we're designing new materials and changing the function of existing ones to reach a specific desired goal in active food packaging, for example," says Goddard. "We're creating materials to do something more than just contain the food, something that also reduces food waste and maintains safety while reducing our reliance on synthetic additives."

One thrust in Goddard's research group is synthesis of active packaging materials that chelate metal ions, binding them to make them less reactive in foods. This can help to reduce spoilage and microbial contamination and maintain cleanliness and safety.

Another technique her lab is working on is to develop polymer coatings for surfaces to make them less prone to fouling. She explains, "Fouling is the crud that builds up in the pan when you fry an egg or boil milk. When you think on an industrial scale, for example milk pasteurization, fouling becomes a huge issue in terms of quality, safety and green processing."

She adds, "We address this at the research level to make things that work, that are affordable and practical. Manufacturers find value in relying less on chemical cleaners that force them to stop production and clean the equipment all the time. Our non-fouling polymer coatings not only reduce the buildup of microbial biofilms but reduce the need for chemical cleaners. We're developing surface modifications that can scale up from the lab to the factory level."

Micha Peleg, Bob Levin, Ruth Witkowski and Mark Normand Retire from UMass Food Science

Micha Peleg is retiring after an extremely productive career at UMass Food Science as one of the most innovative Food Engineers in the world. He has worked on a variety of Food Science challenges including the rheology of brittle foods, squeezing flow viscometry, physical

properties of powders, texture perception, microbial population dynamics, microbial survival and growth kinetics. Micha has published over 300 papers and was named as a Thomson Reuters Highly Cited Researcher. In addition, Micha has received research awards from IFT, Cereal Chemists and the World Innovation Foundation.

Micha's former student, Maria Corredini, is coordinating an international symposium on Innovation in Food Engineering to celebrate Micah's outstanding career. Program details and registration are at: https://www.regonline.com/Register/Checkin.aspx?EventID=1732516.

All proceeds from the symposium and donations from Alumni and Friends of the Department will be used to establish International Travel Scholarships for graduate students. Donations can be made at https://securelb.imodules.com/s/1640/alumni/interior-nonav.aspx?sid=1640&gid=2&pgid=443&cid=1121&dids=2506.

Robert Levin is retiring after being a UMass Food Science faculty member for 50 years. Bob's research focused on detection of mutagens and carcinogens, microbial food spoilage enzymes, immuno assays, fermentation technology and PCR detection and quantitation of E. coli O157:H7, Listeria monocytogenes, vibrio parahaemolyticus and V. vulnificus in seafood. Dr. Levin was Chairman of the Atlantic Fisheries Technological Conference, President of the Connecticut Valley Chapter of American Society for Microbiology and an editorial board member for Journal of Food Biochemistry, Journal of Food Safety, and Journal of Food Protection. Bob published over 250 manuscripts that were cited over 2000 times.

Long time research technicians, **Ruth Witkowski** and **Mark Normad** are both retiring this summer. Ruth was instrumental in the success of our Food Microbiology group. She provided critical support for teaching, research and graduate student training. Ruth also helped tremendously as building coordinator and leading our efforts to improve laboratory safety. Mark, who had extensive knowledge of computer systems, worked closely with Dr. Peleg to develop numerous food models and Wolfram Demonstrations that have been utilized by numerous food companies. He also provided critical Departmental service with telecommunication, energy sustainability and helped students and staff with many IT challenges.

We will miss all of our retiring faculty and staff and deeply appreciate all their hard work and dedication to the Department. We wish them the best of luck in their retirement.

UMass at IFT

UMass Food Science had an excellent IFT meeting. In addition to the faculty awards highlighted above, **Elvira Sukamtoh** received 2nd place for her paper "Effects and Mechanisms of Curcumin on Lymphangiogenesis in vitro" in the Undergraduate Paper Competition and **Shintaro Pang** received 2nd place in the IFT Global Student Innovation Challenge. **Maxine Roman** earned top prize in the packaging poster competition and earned the division's best volunteer award. **Minqi Wang** received 2nd place in the American Association of Food Scientists for the Indian Subcontinent poster competition.

We had two Product Development Team Finalists including the Disney - IFTSA Product Development Competition where the team of **Xiao**

Xiao, **Andrea Lo**, **Jen Komaiko**, **Becca Walker**, and **Kevin Lee** earned an honorable mention of their Cinderella's Chicken and Veggie Bites.

In addition, in the IFTSA Developing Solutions for Developing Countries Competition the team of **Justine McAllister**, **Estefania Marti**, **Cansu Gumus**, **Ellie Florio** and **Lianna** Tilton received 3rd prize for their Meal Malade protein supplement product.

Faculty News

Amanda Kinchla gave a talk on Scientific Approaches to Improve On-Farm Food Safety at the North American Agricultural Marketing Officials meeting in Salem, MA. She chaired a symposia entitled, "Bacteriophages for Food Safety: Advances in Prevention and Detection" at the International Association of Food Protection meeting in Portland, OR. She also taught 50- 4H Summer of Science Campers about the science of food.

Eric Decker was elected as a member-at-large on the American Oil Chemist Society. He also gave lectures at the Korean Society of Food Science and Technology Annual Meeting in Busan, Korea, Academy of Nutrition in Chicago, University of Hoenheim, Germany and the Whole Grain Summit in Oregon.

Lili He received two industrial funds, one from American River Nutrition Inc. to develop quality control methods for tocotrienols and one from Agiltron Inc. for development of a portable SERS detector for detection of trace-levels of polycyclic aromatic hydrocarbons on superfund sites. Her students presented several papers at Gordon IFT, and IAFP conferences.

Ron Labbe presented a paper at Federation of European Microbiology Societies biannual meeting in Maastricht, The Netherlands

Julian McClements gave invited lectures at a Nanotechnology Gordon Conference in Waltham, MA and at the Delivery of Functionality Conference in Paris, France where he talked about excipient foods.

Yeonhwa Park presented a talk at the AOCS meeting in Orlando. Her students, **Yoo Kim**, took 1st place for Graduate Students poster competition for AOCS Health and Nutrition Division; **Xiao Xiao** received Burdock Group Travel Award from the Food Safety Specialty Section from the Society of Toxicology; and **Amanda Rutherford** was selected as the Rising Researcher by UMass.

Micha Peleg gave the concluding keynote address at the European COST School on Modeling the Kinetics of Microbial Inactivation by Pulsed Electric Fields, February 2015, Salerno, Italy.

Micha also received an IAEF Life Achievement Award at ICEF 12 (International Conference on Engineering and Food), June 2015, Quebec City, Canada.

David Sela's collaborative work with Katie Hinde at Harvard was written up in an article in National Geographic http://phenomena.nationalgeographic.com/2015/04/08/could-mothers-milk-nourish-mind-manipulating-microbes/. David's undergraduate student advisee, Jonah Einson, was awarded an American Society for Microbiology undergraduate research fellowship.

Hang Xiao was invited to give a talk on "gastrointestinal fate of bioactive food components" in the Department of Nutrition and Food Science at the Texas A&M University. Dr. Xiao's research group presented their research findings (7 oral presentations and 11 poster presentations) in the 2015 Experimental Biology Meeting in Boston. Dr. Xiao was named as the Chair Elect of IFT's Food Chemistry Division.

Upcoming Short Courses:

Better Process Control School:
UMass Amherst Campus, Amherst, MA, November 17-20th, 2015.

The Better Process Control School (BPCS) certifies supervisors of thermal processing systems, acidification, and container closure evaluation programs for low-acid and acidified canned foods. Each processor of low-acid or acidified foods must operate with a certified supervisor on hand at all times during processing. This program satisfies the training requirements specified in both the FDA and USDA regulations. Instructors for this school are drawn from the Food and Drug Administration (FDA), the University of Massachusetts, and industry. For more information and registration go to: https://www.regonline.com/UMass_BPSC

HACCP: UMass Amherst Campus, Amherst, MA, January 12-14th, 2016.

This workshop will provide the tools for you to complete the requirements for HACCP (Hazard Analysis Critical Control Point) certification, understand HACCP principles, identify the resources needed to develop, implement and maintain a HACCP plan, understand and identify process step hazard assessment and understand and identify steps required to determine critical control points. This course will include interactive exercises to help illustrate HACCP planning with an emphasis on FDA regulated food products. For more information and registration go to: https://www.regonline.com/HACCP_JAN2016