



University of Massachusetts  
Department of Food Science Newsletter  
Volume 22, Number 2, 2010

## UMass at IFT

The UMass contingent was once again well represented at IFT. We had a great Alumni Breakfast on Tuesday morning with over 40 alumni, faculty and students in attendance (see picture below). This was our **21<sup>st</sup> consecutive Alumni Breakfast**. These outstanding attendance numbers which continue year after year shows the amazing dedication of our alumni. It was wonderful to visit with everyone and discover how our Food Science family continues to grow and succeed.



Additional great news at IFT included **Julian McClements** receiving the **Marcel Loncin Research Prize** and **Bob Ross** and **Noel Anderson** being named **IFT Fellows** (see summaries below). **Gil Leveille** gave the “**The First Annual Gilbert A. Leveille Lectureship Recognizing Contributions at the Interface of Food Science & Nutrition**” a new honor to be presented on alternating years of the IFT and ASN annual meetings. Students and Professors were well represented in the scientific program giving 3 symposium presentations, 8 posters and

serving as moderators in 5 sessions. One of our students, **Jay Gilbert**, was a finalist in the **IFT Student Association Undergraduate Research Competition**. Jay's accomplishment was particularly noteworthy in that he is only a freshman.

## **David Julian McClements Receives IFT's Top Research Award**

From <http://www.ift.org/newsroom/news-releases.aspx>

CHICAGO - **David Julian McClements**, Professor, University of Massachusetts has been selected as the winner of the **2010 Marcel Loncin Research Prize** by the **Institute of Food Technologists** (IFT), a not-for-profit international society with members working in food science, technology and related professions.

The Marcel Loncin Research Prize, given every other year, was first awarded in 1994. It honors and provides research funding to an IFT member or nonmember scientist or engineer conducting basic chemistry/physics/engineering research applied to food processing and improvement of food quality. The award will be presented at IFT's Annual Meeting and Food Expo in Chicago, IL on July 17th 2010, and includes a \$5,000 honorarium and a plaque from IFT.

McClements' proposed research will focus on developing food-grade delivery systems to encapsulate, protect, and release bioactive lipophilic components for incorporation into food products. Further, McClements will strive to develop guidelines for the food industry to facilitate the rational design and fabrication of delivery systems for bioactive food ingredients. These delivery systems could enable the creation of functional foods designed to maintain health and wellness. Over the course of the research project, he will help young scientists to develop their skills through mentorship and exposure to the health and wellness field.

## **Robert E. Ross Receives IFT Recognition**

From <http://www.ift.org/newsroom/news-releases.aspx>

Chicago, IL- **Robert E. Ross, President, Business and Technical Consulting LLC**, was elected **Institute of Food Technologists Fellow** in 2010 for his contributions to the food industry in creating and growing businesses globally by the development and exchange of new products and technologies.

Dr. Ross brings a combination of strong management abilities and technical expertise to bear on a wide range of disciplines across the product development process, which has garnered him multiple awards for marketing and innovation within the food industry. He holds 15 patents for innovative technology, and has applied food science principles to help identify, develop, and introduce more than 600 new food products for companies such as Nestle, Pepperidge Farm (Div. Campbell Soup), Nabisco and Hunt-Wesson. His service to IFT includes being an IFT Foundation Board member and Chair of the Nutmeg Section. He is currently Chair of the Product Development Division and a member of the Foodservice and Nutrition Divisions.

## **Noel Anderson Receives IFT Recognition**

From <http://www.ift.org/newsroom/news-releases.aspx>

Chicago, IL- **Noel Anderson, Vice President, Worldwide Technical Insights, PepsiCo**, was elected **Institute of Food Technologists Fellow** in 2010 for creating collaborations between industry, government, and international groups and for his work with universities and students to promote continuums between the academic and professional sector.

Anderson has led many product development and technical efforts at Kraft and PepsiCo across numerous product categories delivering significant innovations in the marketplace. He has been awarded three patents for his work with gelatin and gelled confections while working with Kraft Foods. As a leader and current Chair of the Food Science Advisory Board for the University of Massachusetts, Anderson spearheaded major fundraising efforts for research programs, food science conferences, and scholarships (\$1 million) as well as helped create a strategic research alliance that fosters technology transfer opportunities between academia and 26 food companies. The most recent campaign has raised more than \$1.8 million dollars to create the Fergus M. Clydesdale Center for Research in Health & Wellness. A firm believer in strong mentorship, Anderson is a tireless supporter of the Summer Scholars program at Cornell University and the University of Massachusetts. This program has given 150 undergraduate science students exposure to food science and the food industry, allowing them to conduct independent research under the guidance of a faculty member.

## **Chenoweth Renovations Continue**

Work on the **Fergus Clydesdale Foods for Health and Wellness Center** continues to move forward. As mentioned in previous newsletters, we have had 4 labs renovated. Since then, another lab has been finished and 3 more are being created out of the old Hotel and Restaurant and Tourism Administration kitchen and dining room space. As part of the most recent renovation, the University has also invested in major systems upgrades for the building. This includes a new heating, ventilating and air conditioning system and an electrical upgrade. You can see some of the progress to these systems in the pictures below.



**Placement of the heating, ventilation and fume hood on the top of Chenoweth.**



**The new heating ventilation and cooling system in the pilot plant in the space formally occupied by the smoke house.**



**One of the new labs in the Fergus Clydesdale Foods for Health and Wellness Center. The wires are for the electrical upgrade for the entire building.**

Renovations are right on schedule and should be done in early December and occupied in January or February. We are very excited about this new addition to our building as we strive to give our faculty access to ultra-modern labs. Thanks again to all of you who helped to make this ambitious project a reality.

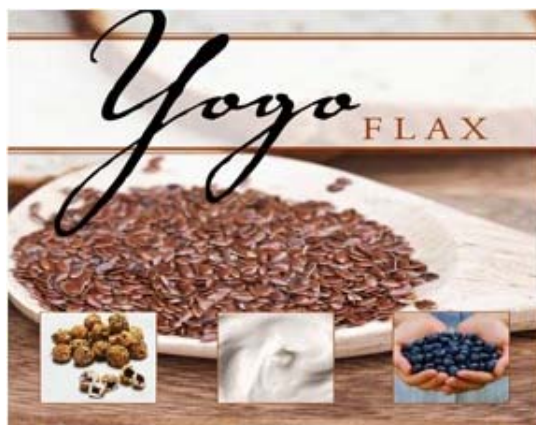
## Food Science Student Activities

The **Food Science Club** was very active this fall participating in both the **IFT Student Association College Bowl** and the **Product Development Competition**. The College Bowl Team made the trip to Cornell to participate in the competition. Unfortunately, they did not advance to the National Competition at IFT but the team consisted of several freshman and sophomores so the event was a great experience that should help build on future success for the team. Thanks again to all the donors that support the Department as gifts from Alumni made it possible for the students to have this enriching experience.



**Food Science Quiz Bowl Team (left to right). Bottom row: Tanushree Tokle, Ashley Horner, Jennifer LeMay, Alexis Minniti, Catherine Fill, Alissa Allen. Top row: Chris Demopoulos, Toby Smelts, Nickolas Pucel, Dan Vollmer, Kashif Ahmed, Jackie Mathews.**

The **Food Science Club** was also involved in the **IFT Product Development Team**. Their product, **YogoFlax** was a soft and chewy blueberry-açaí jelly center, coated in smooth yogurt with a crunchy flax and whole grain outer shell. The jelly center was made from real fruit purees that provide a deep rich flavor that is complimented by the creaminess from the yogurt coating. The outer coating is made from five highly nutritious grains that not only provide a unique flavor to the product but also contributes to the textural contrast that makes YogoFlax stand out from its competitors. This product was designed as an exceptionally nutritious and portable snack for on-the-go adults. The product scored an 84 out of 100, which was not quite enough to make the finals. Graduate student **Jeffrey Barish** was the team leader and was assisted by undergraduates **Jay Gilbert, Ashley Horner, Bruna Pollack** and **Mark Duffey**.



We also had a very exciting **graduation** ceremony this spring as the University changed the format of the celebration. There was an overall campus graduation in the football stadium as usual, but immediately following, the student broke up into individual colleges for a second ceremony. Our College ceremony was held in the Mullins Center where each student had the opportunity to come up on stage and receive their diploma. **Jackie Mathews**, the Food Science Club President, gave an exceptional keynote address about her experiences in Food Science. After the ceremony, the Department held a reception for the students and their families so we could all have a little one-on-one time and the faculty could have a chance to meet and thank the parents. With the help of **Professors Goddard, McLandsborough and Nugen**, we served a variety of foods that the students made in their Food Processing class. This gave the parents a great opportunity to see what the students had accomplished during the semester. Again, this event was made possible by the generous gifts of our Alumni.



**Graduating Seniors (left to right): Karol Chin, Ashley Han, Laure Placzek, Dr. McLandsborough, Kaitlin Ewald, Engelbert Ortega, Jackie Mathews and Dan Vollmer.**

## Research News

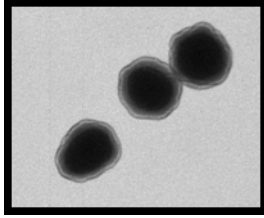


The Nugen Research Group has been working hard to develop new strategies for detecting pathogens and toxins in food. The research goal is to develop novel **biosensors** which can enable producers to rapidly identify potential hazards or spoilage organisms prior to product release. The group is working on diagnostic methods ranging from lateral flow assays to microfluidic chips. Using new methods in nanotechnology and microfabrication the group has demonstrated new sensing methods. The Nugen Research Group is making use of the University's new state-of-the-art class 100 cleanroom for the fabrication of microfluidic chips to be used in food analysis. Researchers in the group are using photolithography and metal deposition to fabricate microstructures for a more sensitive detection.

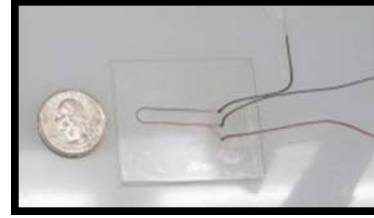
**Advanced sensing elements:** The group has been developing probes for more sensitive detection of targets. This involves complex nanoparticles which can bind to a target and produce brighter signals as compared to traditional methods.

**Lab-on-a-chip:** The goal of bringing complete assays into one microfluidic device involves many complicated steps. These steps may involve sample preparation, amplification and a detection step. By combining a complete assay into a miniaturized chip, analysis can be more rapid, portable and will consume less reagents thus lowering costs.

Sam Nugen received his B.S. in Animal and Food Science at the University of Vermont. He then obtained his M.S. in Food Engineering at Cornell University prior to working at Kraft Foods in Tarrytown, NY as a Research Engineer. Following four years at Kraft, he returned to Cornell University to obtain a Ph.D. under Professor Antje Baeumner in Food Science and Biological Engineering. Sam performed his postdoctoral research with Professor Baeumner in the Department of Biological Engineering where he continued his research in microfluidics, nanofabrication and biosensors.



Gold nanoparticle coated in a silica shell



Microfluidic channel showing mixing of reagents.

## Faculty and Staff News



### **Hang Xiao develops novel food-based strategies for cancer prevention**

Hang Xiao, Assistant Professor of Food Science, recently received a \$435,000 grant from the National Cancer Institute to develop a novel diet-based strategy for preventing colon cancer. He is investigating a new class of dietary compounds originating from oranges that could synergistically interact with each other to offer enhanced protective effects against colon cancer development.

Colon cancer is one of the leading causes of cancer death in both men and women in the Western countries, including the United States, Xiao says, and the incidence of colon cancer is strongly associated with dietary patterns, for example, high fat diet. Accumulating evidence suggests that cancer prevention through dietary intervention is a logical and practical approach to controlling colon cancer.

Many bioactive dietary components have been studied for possible cancer preventive effects. Results showed that the intake of combined bioactive dietary components, such as those present in whole fruits and vegetables, may provide enhanced protective effects over the intake of an isolated pure compound. Xiao explains, this is due, at least in part, to synergistic interaction among bioactive components to produce considerably stronger inhibitory effects against cancer development. The enhanced efficacy by the combination might also lower the dose required for each bioactive component in the combination, and in turn reduce unwanted side effects possibly caused by high-dose single-agent administration. Thus, inhibition of cancer development by a combination of different dietary components is a promising strategy for cancer prevention. However, Xiao says, the current poor understanding of dietary component interactions has greatly limited the utilization of this strategy.

In the proposed project, Xiao and colleagues will focus on the interaction between two novel compounds derived from the peel of sweet orange. The goal is to establish a detailed understanding of the mode of interaction between the two compounds in combination to synergistically inhibit colon cancer development. The information obtained from the project can be expected to facilitate the development of novel preventive strategies to reduce the incidence of colon cancer. This may ultimately provide a solid scientific foundation to use orange peel (abundant waste from juice industry) as a health-promoting dietary ingredient for colon cancer prevention, which will have great impacts on public health.

#### **D. Julian McClements**



If winning IFT's top research award wasn't enough, Julian also received the Stephen S. Chang Award from the American Oil Chemistry Society. This award recognizes a scientist, technologist, or engineer who has made decisive accomplishments in basic research for the improvement or development of products related to lipids. The award was established by former AOCs President Stephen S. Chang and his wife, Lucy, for individuals who have made significant contributions through a single breakthrough or through an accumulation of publications. Julian was also the co-organizer along with Uri Lesmes, one of our Post Docs, of the IFT symposium: "Rational design of food delivery systems: Physicochemical basis of food component digestion, release and absorption".

#### **Ron Labbe**

Ron presented a paper entitled "RAPD-PCR Determination of Spore Population Dynamics in Inoculated Pack Studies" at this year's International Association of Food Protection. Ron has also been working hard to help the Department develop a one year Master program for non-Food Scientists who would like to transition into the field. If you know of anyone who might be interested in this program, please have them contact Ron ([rlabbe@foodsci.umass.edu](mailto:rlabbe@foodsci.umass.edu)).

#### **Eric Decker**

I have continued my work with Food Forum of the Institute of Medicine where I was on the organizing committee of a workshop entitled "Development of Dietary Guidance for Non-Nutrient Dietary Components". I also gave a keynote address entitled "Rethinking Oxidation in Bulk Oils: Role of Physical Structures" for the Lipid Oxidation Division of AOCs. Finally, I have been giving a series of talks on the "Benefits of Food Processing" at "The Future of Grains in Schools" symposium at the University of Minnesota and at a workshop at General Mills.

### **Micha Peleg**

Micha was invited to the University of Salerno in Italy to present 4 seminars on microbial growth and inactivation, nonlinear kinetics, texture and glass transition, and the Wolfram Demonstrations as a tool in Food Engineering education and practice. Micha and Mark Normand also just posted their 50<sup>th</sup> Wolfram Demonstrations on the web. To see them open: <http://demonstrations.wolfram.com/search.html?query=Normand&submit.x=13&submit.y=5>

### **Julie Goddard**

Julie and her graduate student Jeffrey Barish had a paper accepted to Journal of Applied Polymer Science on "Topographical and Chemical Characterization of Polymer Surfaces Modified by Physical and Chemical Processes" and gave a research presentation at IFT on "Analysis of nano-scale surface modifications of polyethylene films for active packaging applications".

### **Yeonhwa Park**

The big news for Yeonhwa is that she received both tenure and promotion to Associate Professor. In addition, Yeonhwa gave an invited talk on Nutrition in Schools at this year's Wellness 10 conference hosted by IFT. Also, Yeonhwa and her students gave 3 poster presentations at the Experimental Biology Meeting and Yeonhwa gave 4 invited presentations at Universities in Korea.

### **Sam Nugen**

This summer the Nugen Research Group presented four research posters at technical conferences. In addition, Professor Nugen was invited to give a talk on Environmental Detection at the Northeast Regional Meeting (NERM) of the American Chemical Society. Professor Nugen also attended the Gordon Research Conference on Bioanalytical Sensors where he presented his laboratory's progress.

### **Bob Levin**

Professor Levin recently spent a week on the gulf coast as a technical consultant regarding bacterial remediation of the deep water oil leak.

### **Kalidas Shetty**

Kali has been working on developing collaborative MS programs in Food Science and Post-Harvest Biotechnology with Agricultural Universities in India in the States of Karnataka (Bangalore) and Meghalaya (Tura). Kali also continues to work with US State Department to develop US-India Science and Technology collaborations in Asia, Africa and Latin America. As part of this effort, he attended an important US-India Joint Commission Meeting this summer.

Finally, **Jean Alamed**, our Food Chemistry Research Technician, received Chancellor Robert C. Holub's Citation Award for outstanding contributions to the University. Jean is in the top row on the far left. Chancellor Holub is in the middle of the top row.



Finally, please make long range plans for our next **Alumni Weekend** which will be held in the fall of 201. Stop by to see our renovations if you are in the area.

Eric Decker  
Department Head