Alzheimer's Disease Risk Reduction with Food Bioactive Components

By Dr. Lucy Sun Hwang
Graduate Institute of Food Sci. and Tech., National Taiwan University, Taipei, Taiwan

Abstract

Alzheimer’s Disease (AD) is a progressive neurodegenerative disorder which is the most common cause of dementia in the aged population. Many edible plant materials have been reported to have the potential of delaying the progress of AD. Among them, Ginkgo biloba was the most famous one. Its leaf extract, EGb 761, was found to increase the cerebral blood flow and protect neurons after mild ischemia. Tumeric has also been well documented to possess anti-AD effects. Curcumin was the active component and was found to inhibit Aβ (β-Amyloid peptide) deposition, Aβ oligomerization, and tau protein phosphorylation in the brain of AD animal model. Green tea catechins have neuroprotective actions towards AD by reducing Aβ mediated cognitive impairment. Z-ligustilide, the main active ingredient of many Umbelliferae medicinal plants, was reported to modulate TNF-α activated NF-κB signaling pathway with respect to its protective effect against Aβ E2385-induced neurotoxicity. It thus has the potential for the protection and treatment of cognitive deficits in AD. This presentation will provide a review of the anti-AD effects of these bioactives.

Whole Food Approach for Chronic Disease Prevention and Healthy Aging

By Dr. Rui Hai Liu
Department of Food Science, Cornell University, USA

Abstract

Epidemiological evidence has demonstrated that a healthy eating pattern with increased consumption of fruits, vegetables, whole grains, and other plant-based foods is associated with risk reduction of developing chronic diseases, such as heart disease, cancer, stroke, diabetes, Alzheimer’s disease, cataracts, and age-related function decline. Bioactive compounds in fruits, vegetables, and whole grains may, in part, be responsible for their health benefits. Our group proposed that the major health benefits of a diet rich in fruits, vegetables, and whole grains are predominately attributed to the additive and synergistic interactions of bioactive compounds and other food components in whole foods by targeting multiple signal transduction pathways. More and more evidence suggests whole foods play important roles in reducing the incidence and prevalence of chronic diseases. This presentation will present and debate our current research on the health benefits of whole foods, health-promoting synergies and interactions of bioactive compounds and nutrients for chronic disease prevention and health aging, and focus on the plausible mechanisms of action behind the biological effects. The additive and synergistic interactions of the phytochemicals and nutrients in the wide varieties of fruits, vegetables, and whole grains will be also discussed.

Micronanostructure: A Key to Unlock the Complex System of Food

By Dr. Pingfan Rao
Zhejiang Gongshang University, China

Abstract

When food ingredients undergo processing, some compositions interact with each other to generate new attributes as is in Maillard reaction, while some others can rid themselves of the confinement of the original structures and migrate from the solid phase to the solution phase with the disruption of cellular structures. The former reaction has been extensively investigated, but the latter remains almost unknown. Our recent works indicate that the latter is the physiochemical reaction that endows food with some of its most important biological functions. Upon entering the liquid phase, some of the selected newly liberated molecules assemble into new structures in nano to micro scale with outstanding excellent physiochemical and biological properties.

With this insight, even cooking is no more a low-tech or no-tech chore but a process for natural nanoparticle preparation, and food is a micronano system most closely related to the wellness human being. What the formation of nanoparticle as a result of processing will be illustrated with our work on nanoparticles from Ailima orientalis, a medicinal herb. Meanwhile, by a method of visualization of intracellular superoxide distribution in living rate, through the connection of the bile duct, the hepatic superoxide was found to be discharged into the intestine, the most important site for food and body interaction. With the insight of the intestine’s involvement in the storage and disposal of superoxide as the visceral organ’s metabolic waste, the interaction of food MicroNanoparticles with the body can be expected to be elucidated to be of much greater significance than ever imagined in a more straightforward manner, and the notion that food will be the medicine can be in a more convincing manner.
FST Lunchtime Seminar

DATE: May 31, 2016 (Tue)
TIME: 11am – 12pm
VENUE: Seminar Room S14-06-20
HOST: Prof. Zhou Weibiao

About the speakers

Dr. Lucy Sun Hwang
Ph.D.

Lucy Sun Hwang has been Professor Emeritus, Graduate Institute of Food Science and Technology, National Taiwan University since 2013. She is also Editor-in-Chief of the Journal of Food and Drug Analysis (SCI Journal) and President of the International Life Sciences Institute (ILSI) Taiwan Branch.

Dr. Hwang received her B.S degree in Chemistry from National Taiwan University in 1970 and her Ph.D. degree in Food Science from Rutgers University in 1975. She was the Director of the Graduate Institute from 1985–1991 and a Professor at the Institute from 1982 to 2007. She also was President of the Chinese Agricultural Chemical Society (1991–1993), the Chinese Institute of Food Science and Technology (1995–1998), and the Taiwan Association of Analytical Communities (Taiwan AOAC, 2009–2011).

She was elected IFT fellow in 2004 and Fellow of the Academy of the International Union of Food Science and Technology (IUFoST) in 2006.

Dr. Hwang also has received numerous Honours and Awards during her career: the Outstanding Contributions and Service Award, International Society for Nutraceuticals and Functional Foods (ISNFF) and the Health Medal, Department of Health, The Executive Yuan (both in 2013); the Distinguished Contribution toward Taiwan Food Industry Award, Taiwan Association for Food Science and Technology (2012); Outstanding Contribution Award, Health Food Society of Taiwan (2009); Professional Achievement Award, Chinese American Food Society (2006); Outstanding Teaching Award, National Taiwan University (2006) and the Outstanding Research Award, National Science Council, Republic of China (1995).

Dr. Rui Hai Liu
M.D., Ph.D.

Rui Hai Liu is a Professor in the Department of Food Science at Cornell University. He received his Ph.D. in Toxicology from Cornell University, and holds an M.D. and an M.S. in Nutrition and Food Toxicology. Liu teaches an undergraduate course, Food Analysis, and two graduate-level courses, Functional Foods and Dietary Supplements for Health, and Food Lipids.

Dr. Liu’s research program is focused on diet and cancer, the effects of functional foods/nutraceuticals on chronic disease risks, and bioactive compounds in natural products and herbal remedies for anticancer and antiviral activity.

Dr. Liu has been named as a Highly Cited Researcher by Thomson Reuters. He has been ranked as one of the top 5 scientists (ranked No. 3 by total citations, and ranked No. 5 by impact, average citations per paper) in the field of Agricultural Sciences (including Nutrition and Food Science) by Essential Science Indicators (ESI). Dr. Liu has been named in the World’s Most Influential Scientific Minds for 2014 and 2015 by Thomson Reuters.

Dr. Liu was elected as a Fellow of the International Academy of Food Science and Technology (IAFoST), a Fellow of the Division of Agricultural and Food Chemistry (AGFD) of the American Chemical Society (ACS), a Fellow of the Institute of Food Technologists (IFT), a Fellow of the American Association for the Advancement of Science (AAAS), and a Fellow of the Royal Society of Chemistry. He received 2016 General Mills Institute of Health and Nutrition Innovation Award for outstanding contributions to the health benefits of whole grains from American Society for Nutrition.

Dr. Pingfan Rao
Ph.D.

Pingfan Rao, Ph.D., received BEng in food technology from Fuzhou University of China in 1982, Msc in food science from Hiroshima University of Japan in 1984, and PhD in biochemistry from Osaka University of Japan in 1990. He is currently Professor and founding Director of CASIBS—Zhejiang Gongshang University Joint Center for Food and Nutrition Research, and a Professor of Fuzhou University in China.

He is Past President (2012-14) of the International Union of Food Science and Technology, a fellow of International Academy of Food Science and Technology, Vice President of the Chinese Institute of Food Science and Technology. His research focuses primarily on identifying and characterizing bioactive proteins and expression and scale production of recombinant enzymes, protein derivatizes as the active ingredients of traditional Chinese medicine and food, new methodology for cell separation and superoxide channels.

Topics will include:

Alzheimer’s Disease Risk Reduction with Food Bioactive Components
Professor Lucy Sun Hwang

Whole Food Approach for Chronic Disease Prevention and Healthy Aging
Professor Rui Hai Liu

Micronano Structure: A Key to Unlock Complex System of Food
Professor Pingfan Rao