Diet and Optimum Health 2017

Innovative Approaches to Improving Health

September 13 – 16 · Corvallis, Oregon

Oregon State University
Linus Pauling Institute
The Linus Pauling Institute Prize for Health Research is awarded in recognition of innovation and excellence in research relating to the roles of vitamins, essential minerals, and phytochemicals in promoting optimum health and preventing or treating disease, and the roles of oxidative/nitrative stress and antioxidants in human health and disease.

The prize also recognizes successful efforts to disseminate and implement knowledge on diet, lifestyle, and health to enhance public health and reduce suffering from disease.

The LPI Prize for Health Research is awarded biennially at the Diet and Optimum Health conference. The winner of this year’s prize will be announced on Friday, September 15th during the conference banquet.

**Previous recipients of the LPI Prize**

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
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<tbody>
<tr>
<td>Bruce N. Ames</td>
<td>2001</td>
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<tr>
<td>Walter C. Willett</td>
<td>2003</td>
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<td>Paul Talalay</td>
<td>2005</td>
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<td>Mark A. Levine</td>
<td>2007</td>
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<td>Michael F. Holick</td>
<td>2009</td>
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<td>Connie K. Weaver</td>
<td>2011</td>
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<td>Helmut Sies</td>
<td>2013</td>
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<td>George Bailey</td>
<td>2015</td>
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September 13, 2017

Welcome to Corvallis!

On behalf of the members of the Linus Pauling Institute at Oregon State University, we welcome you to the Institute's 9th biennial conference on Diet and Optimum Health. The theme of this year's conference emphasizes “Innovative approaches to improving health” with a strong focus on the cutting-edge science behind the function of dietary bioactives and micronutrients. As a special tribute to Linus Pauling, we plan an entire day dedicated to vitamin C research in the treatment of cancer and sepsis.

This is also an auspicious year for the Linus Pauling Institute: We are celebrating our 20th year on the beautiful Oregon State University campus. As such, we have chosen this year to honor the career of our first permanent LPI director, Balz Frei, PhD, who served from 1997-2016. Turning an eye to the future, we also welcome our next director, Richard van Breemen, PhD, who will guide the Institute for many years to come.

Many thanks to our supporters and sponsors (on the back page) and all the folks who helped get this conference off the ground: the LPI faculty, especially the advisory committee (Adrian “Fritz” Gombart, Dave Williams, Emily Ho); the DOH administrative committee (Barbara McVicar, Alex Michels, Caitlyn Reilley, Dustin Helvie); and OSU Conference Services (Jen Stotts, Carly Weber).

We are pleased that you can join us for this four-day program that reflects the depth of the scientific and outreach programs at the Linus Pauling Institute. Thanks for making this event a success.

Enjoy the conference,

Maret G Traber, PhD
Ava Helen Pauling Professor
Linus Pauling Institute
College of Public Health & Human Sciences
Oregon State University

Jan Frederik Stevens, PhD
Director ad interim
Linus Pauling Institute
College of Pharmacy
Oregon State University
Wednesday, September 13th

7:00 AM  Registration begins  
Foyer of CH2M Hill Alumni Center

7:30 – 8:30 AM  Breakfast  
Provided at the CH2M Hill Alumni Center

8:30 – 9:00 AM  Welcome  
Maret Traber, PhD, Conference Chair  
Fred Stevens, PhD, Interim Director  
Linus Pauling Institute, Oregon State University, Corvallis, OR

   Proclamation  
   Biff Traber, Mayor of Corvallis

   A Tribute to Balz Frei  
   Chair: Tory Hagen, PhD, Linus Pauling Institute, Oregon State University

   9:00 – 9:30 AM  Redox control of vascular function: Adventures with Balz Frei  
   John F. Keaney, Jr., MD  
   University of Massachusetts Medical School, Worcester, MA

   9:30 – 10:00 AM  From DIM to SMaRT in 30 years  
   Roderick Dashwood, PhD  
   Texas A&M University, Houston, TX

   10:00 – 10:30 AM  The role of bioactives in redox regulation  
   Helmut Sies, MD  
   Heinrich Heine Universität, Düsseldorf, Germany

   10:30 – 11:00 AM  Coffee/tea break
Dietary Components and the Microbiome
Chair: Fritz Gombart, PhD, Linus Pauling Institute, Oregon State University

11:00 – 11:30 AM  Dietary evolution, and the microbiome
Jens Walter, PhD
University of Alberta, Edmonton, AB, Canada

11:30 – 12:00 PM  Botanical therapeutics and the microbiome
Diana Roopchand, PhD
Rutgers, The State University of New Jersey, New Brunswick, NJ

12:00 – 1:30 PM  Lunch
Provided at the CH2M Hill Alumni Center

Lipid Metabolism
Chair: Fred Stevens, PhD, Linus Pauling Institute, Oregon State University

1:30 – 2:00 PM  Cardiac benefits of medium-chain triglyceride supplements: Odd versus even
Melanie B. Gillingham, PhD, RD
Oregon Health & Science University, Portland, OR

2:00 – 2:30 PM  Phenotypic flexibility: A new way to quantify the effects of food and nutrition on health
Suzan Wopereis, PhD
Netherlands Organization for Applied Scientific Research (TNO), Zeist, The Netherlands

2:30 – 3:00 PM  Phospholipid oxygenation products and their role as potential proximate signals of ferroptotic death
Valerian E. Kagan, PhD, DSc
University of Pittsburgh, Pittsburgh, PA

3:00 – 3:30 PM  Coffee/tea break
**Wednesday, September 13th**

**Update on Vitamin E**
*Chair: Manfred Eggersdorfer, PhD, DSM Nutritional Products, Basel, Switzerland*

- **3:30 – 4:00 PM**  
  *Vitamin E regulation of the development of allergies and allergic asthma immunopathogenesis*  
  Joan Cook-Mills, PhD  
  Northwestern University, Chicago, IL

- **4:00 – 4:30 PM**  
  *Alpha-tocopherol bioavailability is lower in adults with metabolic syndrome*  
  Richard S. Bruno, PhD, RD  
  The Ohio State University, Columbus, OH

- **4:30 – 5:00 PM**  
  *Biokinetics of intravenous vitamin E*  
  Maret Traber, PhD  
  Linus Pauling Institute, Oregon State University, Corvallis, OR

- **5:00 – 5:30 PM**  
  *Round-table discussion: Time for a new RDA?*

- **5:30 – 7:00 PM**  
  *Welcome reception and poster presentations*

**Thursday, September 14th**

- **6:00 AM**  
  *Organized walk/run*

- **7:00 – 8:00 AM**  
  *Breakfast*  
  Provided at the CH2M Hill Alumni Center

**Bioactives and Cancer Prevention**
*Chair: Arup Indra, PhD, Linus Pauling Institute, Oregon State University*

- **8:00 – 8:30 AM**  
  *Cancer chemoprevention by dietary indoles*  
  David Williams, PhD  
  Linus Pauling Institute, Oregon State University, Corvallis, OR
Bioactives and Cancer Prevention (Continued)

8:30 – 9:00 AM  Diet, epigenetics, and cancer prevention
Emily Ho, PhD
Linus Pauling Institute, Oregon State University, Corvallis, OR

9:00 – 9:30 AM  Can an epigenetics diet prevent cancer?
Trygve Tollefsbol, PhD, DO
The University of Alabama at Birmingham, Birmingham, AL

9:30 – 10:00 AM  Coffee/tea break

Metabolism of Bioactives (Polyphenols)
Chair: Neil Shay, PhD, Food Science and Technology, Oregon State University

10:00 – 10:30 AM  The metabolome of [2-14C] (-)-epicatechin in humans: Implications for the assessment of efficacy, safety, and mechanisms of action of polyphenolic bioactives
Hagen Schroeter, PhD
University of California, Davis, CA

10:30 – 11:00 AM  Identification and quantification of novel cranberry-derived (poly)phenol metabolites
Ana Rodriguez-Mateos, PhD
King’s College, London, UK

11:00 – 11:30 AM  Use of nutrigenomics to decipher mechanisms of action of polyphenols mediating their cardiovascular protective effect
Dragan Milenkovic, PhD
French National Institute for Agricultural Research (INRA), Clermont-Ferrand, France

11:30 – 12:00 PM  Athero-protective actions of flavonoids
Roland Stocker, PhD
Victor Chang Cardiac Research Institute, Darlinghurst, NSW, Australia
Thursday, September 14th (Continued)

12:00 – 1:30 PM  **Lunch**  
Provided at the CH2M Hill Alumni Center

**Nutrition and Brain Health**  
*Chair: Gene Bowman, ND, MPH, Nestlé Institute of Health Sciences, Lausanne, Switzerland*

1:30 – 2:00 PM  **Centella asiatica, an edible herb for Alzheimer’s disease?**  
Amala Soumyanath, PhD  
Oregon Health & Science University, Portland, OR

2:00 – 2:30 PM  **Effects of diet on gut-brain interactions**  
Kathy Magnusson, DVM, PhD  
Linus Pauling Institute, Oregon State University, Corvallis, OR

2:30 – 3:00 PM  **Oxidized lipids in brain trauma**  
Hülya Bayir, MD  
Children’s Hospital of Pittsburgh, University of Pittsburgh, Pittsburgh, PA

3:00 – 3:30 PM  **Vitamin C deficiency and synaptic glutamate toxicity in seizures and neurodegeneration**  
Fiona E. Harrison, PhD  
Vanderbilt University Medical Center, Nashville, TN

3:30 – 4:00 PM  **Coffee/tea break**

**Lightning Talks**  
*Chair: Viviana Pérez, PhD, Linus Pauling Institute, Oregon State University*

4:00 – 4:10 PM  **Green tea extract improves microbiota composition and intestinal barrier function to prevent dietary fat-induced obesity by limiting gut-derived endotoxin translocation and adipose TLR4/NFκB inflammation**  
Priyankar Dey, PhD, The Ohio State University
**Thursday, September 14th (Continued)**

**Lightning Talks (continued)**

4:10 – 4:20 PM  Diet-gut microbiota interactions mediated by hop-derived xanthohumols in a mouse obesity model  
Johana Revel, PhD, Oregon State University

4:20 – 4:30 PM  A novel nutritional formulation containing the prebiotic human milk oligosaccharide 2’-fucosyllactose reduces gastrointestinal symptoms and beneficially alters the gut microbiome in adults with gastrointestinal dysfunction  
Jennifer Ryan, ND, National University of Natural Medicine

4:30 – 4:40 PM  Ascorbate deficiency and mitochondrial dysfunction in the APP/PSEN1 mouse models of Alzheimer’s disease  
Shilpy Dixit, Vanderbilt University

4:40 – 4:50 PM  Local sustained delivery of 1α,25(OH)₂D₃ by nanofiber wound dressings induces human cathelicidin antimicrobial peptide expression both in vitro and in vivo  
Yang Zhang, Oregon State University

4:50 – 5:00 PM  Optimizing vitamin C impact in treating infection  
Thomas E. Levy, MD, Peakenenergy.com

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**Friday, September 15th**

6:00 AM  Organized walk/run

7:00 – 8:00 AM  Breakfast  
Provided at the CH2M Hill Alumni Center

**Mechanisms of Vitamin C in Cancer**  
*Chair: Anitra Carr, PhD, University of Otago, Christchurch, New Zealand*

8:00 – 8:30 AM  Ascorbic acid physiology and pharmacology: Foundations for cancer and sepsis therapies  
Mark A. Levine, MD  
NIDDK, National Institutes of Health, Bethesda, MD
### Mechanisms of Vitamin C in Cancer (continued)

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Institution</th>
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<tbody>
<tr>
<td>8:30 – 9:00 AM</td>
<td>Vitamin C-dependent regulation of the hypoxic response in cancer</td>
<td>Margreet Vissers, PhD</td>
<td>University of Otago, Christchurch, New Zealand</td>
</tr>
<tr>
<td>9:00 – 9:30 AM</td>
<td>Vitamin C as a multi-targeting anti-cancer agent</td>
<td>Qi Chen, PhD</td>
<td>University of Kansas Medical Center, Kansas City, KS</td>
</tr>
<tr>
<td>9:30 – 10:00 AM</td>
<td>Vitamin C and bone marrow stem cell transplantation</td>
<td>Gerard Bos, MD, PhD</td>
<td>Maastricht University Medical Centre, Maastricht, The Netherlands</td>
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<tr>
<td>10:00 – 10:30 AM</td>
<td>Coffee/tea break</td>
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### Vitamin C Therapy in Cancer

*Chair: Ramesh Natarajan, PhD, Virginia Commonwealth University, Richmond, VA*

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<th>Time</th>
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<tr>
<td>10:30 – 11:00 AM</td>
<td>The chemical biology of intravenous vitamin C in cancer treatment: Basic science to clinical trials</td>
<td>Garry Buettner, PhD</td>
<td>The University of Iowa, Iowa City, IA</td>
</tr>
<tr>
<td>11:00 – 11:30 AM</td>
<td>Epigenetic treatment of cancer by vitamin C</td>
<td>Gaofeng Wang, PhD</td>
<td>University of Miami Miller School of Medicine, Miami, FL</td>
</tr>
<tr>
<td>11:30 – 12:00 PM</td>
<td>Intravenous vitamin C and chemotherapy in ovarian cancer</td>
<td>Jeanne Drisko, MD</td>
<td>University of Kansas Medical Center, Kansas City, KS</td>
</tr>
<tr>
<td>12:00 – 12:30 PM</td>
<td>Challenges of natural product drug development</td>
<td>Channing J. Paller, MD</td>
<td>Johns Hopkins University School of Medicine, Baltimore, MD</td>
</tr>
<tr>
<td>12:30 – 2:00 PM</td>
<td>Lunch</td>
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<td>Provided at the CH2M Hill Alumni Center</td>
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</table>
**Vitamin C Therapy in Sepsis**  
*Chair: Margreet Vissers, PhD, University of Otago, Christchurch, New Zealand*

2:00 – 2:30 PM  
**Intravenous vitamin C in pre-clinical sepsis and trauma models**  
Ramesh Natarajan, PhD  
Virginia Commonwealth University, Richmond, VA

2:30 – 3:10 PM  
**Intravenous vitamin C as therapy for sepsis-induced acute lung injury**  
Alpha A. (Berry) Fowler, III, MD  
Virginia Commonwealth University, Richmond, VA

3:10 – 3:40 PM  
**Vitamin C requirements and mechanisms of action in severe infection**  
Anitra Carr, PhD  
University of Otago, Christchurch, New Zealand

3:40 – 4:20 PM  
**Vitamin C, hydrocortisone, and thiamine for the treatment of severe sepsis and septic shock: The metabolic resuscitation protocol**  
Paul Marik, MD  
Eastern Virginia Medical School, Norfolk, VA

4:20 – 4:30 PM  
**Farewell remarks**  
Maret Traber, PhD, Conference Chair

6:30 – 9:30 PM  
**LPI reunion and 20th anniversary banquet**  
Ballroom, CH2M Hill Alumni Center

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**Saturday, September 16th**

**Public Session**  
*Chair: Maret Traber, PhD, Linus Pauling Institute, Oregon State University*

9:00 – 11:00 AM  
**Intravenous vitamin C and cancer treatment: Does it work?**  
Jeanne Drisko, MD  
University of Kansas Medical Center, Kansas City, KS

**Diet and cancer prevention**  
Emily Ho, PhD  
Linus Pauling Institute, Oregon State University
Poster Index

**Bioactives**

1. **Design and development of a reporter plasmid for high-throughput screening of botanical extracts and small molecule libraries to discover prenylated flavonoid ligands of FXR**
   Isabelle Logan, Linus Pauling Institute, Oregon State University

2. **Effects of nitrate and nitrite exposure on zebrafish behavior and brain metabolic phenotyping**
   Manuel Garcia-Jaramillo, PhD, Linus Pauling Institute, Oregon State University

3. **Metabolism of xanthohumol and 8-prenylnaringenin by intestinal microbiota**
   Ines Paraiso, Linus Pauling Institute, Oregon State University

4. **Characterization and quantification of phytochemical constituents in the medicinal herb *Centella asiatica* by high-resolution mass spectrometry**
   Armando Alcazar Magana, PhD, Linus Pauling Institute, Oregon State University

5. **Profiling of specific metabolic signatures in deuterium labeled and unlabeled broccoli sprouts with X\textsuperscript{13}CMS**
   Jaewoo Choi, PhD, Linus Pauling Institute, Oregon State University

6. **Diet–gut microbiota interactions mediated by hop-derived xanthohumols in a mouse obesity model**
   Johana Revel, PhD, Linus Pauling Institute, Oregon State University

7. **A novel nutritional formulation containing the prebiotic human milk oligosaccharide 2’-fucosyllactose reduces gastrointestinal symptoms and beneficially alters the gut microbiome in adults with gastrointestinal dysfunction**
   Jennifer Ryan, ND, National University of Natural Medicine

8. **Supplementation of mice fed a high fat diet with xanthohumol and its derivatives changes the composition of the fecal microbiota and is associated with observed metabolic improvements**
   Yang Zhang, Linus Pauling Institute, Oregon State University

9. **Hepatic and gut microbial metabolism of the hop nutraceutical, xanthohumol, in humans**
   Lea-Sophie Ullrich, Linus Pauling Institute, Oregon State University
Bioactives (continued)

10  **Green tea extract improves microbiota composition and intestinal barrier function to prevent dietary fat-induced obesity by limiting gut-derived endotoxin translocation and adipose TLR4/NFκB inflammation**
    Priyankar Dey, PhD, The Ohio State University

11  **Green tea treatment in obese mice with nonalcoholic steatohepatitis lowers hepatic NFκB activation in association with altered relative abundance of phosphatidylcholine and bile acid metabolites**
    Geoffrey Sasaki, The Ohio State University

12  **Effects of dietary resveratrol on the fecundity of a novel model, *Nothobranchius guentheri***
    Andrew Drake, Linus Pauling Institute, Oregon State University

13  **Antiviral activity of scorpion venom peptides**
    Victor Huerta, PrevenOx Orthomolecular Biomedical Research

14  **To whom the side effect of licorice, pseudoaldosteronism, will occur: Case-control study**
    Tetsuhiro Yoshino, MD, PhD, Linus Pauling Institute, Oregon State University

Healthy Diets

20  **Optimizing gut flora for optimum health and disease prevention**
    Anyanwu Chukwudi, University of Nigeria

21  **Eat more plants! A community-based approach to early nutrition education**
    Megan Kuntz, Western University of Health Sciences, COMP-Northwest

22  **Rural kid's cooking camp emphasizing a plant-based diet survey study**
    Leah Nelson, Western University of the Health Sciences, COMP-Northwest

23  **Assessment of gut microbiome role in diet-related changes in cognition**
    Kathy Magnusson, DVM, PhD Linus Pauling Institute, Oregon State University

24  **The cathelicidin antimicrobial peptide gene alters the gut microbiota of mice**
    Miles Rouches, Oregon State University

25  **Dairy milk, regardless of fat content, protects against postprandial hyperglycemia-mediated oxidative stress, dysregulated arginine metabolism and increases in endothelin-1 in prediabetic adults**
    Joshua McDonald, The Ohio State University
Healthspan and Aging

30  Age-related loss of hepatic Nrf2 protein homeostasis is attributed to heightened expression of miR-146a
Nicholas Thomas, PhD, Linus Pauling Institute, Oregon State University

31  The role of proteostasis in protein aggregation in long-lived species
Bharath Sunchu, Linus Pauling Institute, Oregon State University

32  Dietary restriction improves cognitive performance and maintains hepatic Sirt7 levels in *Nothobranchius guentheri*, a short-lived model of aging
Kate Petersen Shay, PhD, Linus Pauling Institute, Oregon State University

33  Long-term supplementation with a novel nutrient blend mimics calorie restriction transcriptomics in multiple tissues of old mice
Angela Mastaloudis, PhD, Nu Skin Enterprises

34  Rapamycin inhibits the secretory phenotype of senescent cells by an Nrf2-independent mechanism
Rong Wang, PhD, Linus Pauling Institute, Oregon State University

35  Safe and proven daily actions to improve your healthspan
Alfred “Roc” Ordman, PhD, Beloit College

Vitamins and Minerals

40  Adverse effects of arsenic exposure and zinc deficiency on pancreatic beta cells and insulin production
Annie Cao, Linus Pauling Institute, Oregon State University

41  Adverse consequences of zinc deficiency and arsenic exposure to zebrafish development
Laura Beaver, PhD, Linus Pauling Institute, Oregon State University

42  Interactions between arsenic exposure and zinc deficiency on zinc status, oxidative stress, and inflammatory response
Carmen Wong, PhD, Linus Pauling Institute, Oregon State University

43  Ascorbate deficiency and mitochondrial dysfunction in the APP/PSEN1 mouse models of Alzheimer’s disease
Shilpy Dixit, Vanderbilt University

44  Local sustained delivery of 1α,25(OH)₂D₃ by nanofiber wound dressings induces human cathelicidin antimicrobial peptide expression both in vitro and in vivo
Yang Zhang, Linus Pauling Institute, Oregon State University
45  Chronic vitamin E deficiency in adult zebrafish dysregulates brain lipids, energy metabolism, and cognitive function
Scott Leonard, MS, Linus Pauling Institute, Oregon State University

50  Application of Quantitative Redox Biology to basic research on the use of pharmacological ascorbate in cancer therapy
Garry Buettner, PhD, The University of Iowa

51  4D quantitative image analysis of cancer cell invasion in a brain microenvironment using ImageJ software
John Gamble, Oregon State University

52  Primary T-cell lymphoblastic leukemia (T-ALL) xenotransplant in zebrafish as a model for chemoprevention
Youngjoo Lee, Linus Pauling Institute, Oregon State University

53  The aryl hydrocarbon receptor mediates growth-inhibitory effects of SU5416 in hepatoma cells
Hyo Sang Jang, PhD, Linus Pauling Institute, Oregon State University

54  Targeting therapy resistant cancer through Bcl-2 functional conversion
Martin Pearce, Oregon State University

55  AhR-dependent induction of p27Kip1 by select AhR ligands
Veronica Puig-Sanvicens, PhD, Oregon State University

56  Grain legume consumption may provide chemo-preventive effects on incident and prevalent colorectal adenoma and colorectal cancer: A meta-analysis of human studies
Thushanthi Perera, Linus Pauling Institute, Oregon State University

57  Chemopreventive response markers to navy bean extract in a mouse model of inflammation-induced colorectal cancer
Gerd Bobe, PhD, Linus Pauling Institute, Oregon State University

Speaker affiliations, photos, and abstracts, and the full-text of poster abstracts: lpi.oregonstate.edu/DOH
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